The *Shape of Life* Project

Summative Evaluation Of
The Shape of Life Series With An Adult Audience

Evaluation of the April 2002 PBS series broadcast

Executive Summary

Report 3 of 3
(Viewer Studies)

Prepared for
Sea Studios Foundation

By

Valerie Knight-Williams
Divan Williams Jr.
Knight-Williams Research Communications

With assistance from
Jon Hinisits

Revised January 2003

Table of Contents

Introduction

The Shape of Life is an eight-part science and natural history television series chronicling the rise and diversity of the animal kingdom. The series is a co-production of National Geographic Television and Sea Studios Foundation with support from The National Science Foundation (NSF). During April 2002, six of the series eight one-hour episodes premiered on PBS over the course of three consecutive Tuesdays from 9-11 pm (April 2nd, 9th, and 16th).

From the project's inception the producers anticipated *The Shape of Life* would take viewers on *a journey to explore the animal kingdom through the blueprints or body plans that shape every species alive today*.[1] Related goals for the series have included[2]:

(i) Building viewer awareness of the animal diversity encountered in everyday life;

(ii) Improving viewer understanding of biology as a scientific process that is accessible to viewers, driven by curiosity, enthusiasm, and objective inquiry, and that consists of tools to define and solve problems; and

(iii) Introducing viewers to a new perspective on the diversity of the animal kingdom that demonstrates: that animals are an elegant statement of the relationship between form and function; that organizing principles underlie animal diversity; and that animal diversity is the result of the evolutionary process through time, natural selection and mutation.

In addition to the broadcast series, *The Shape of Life* project included a longer-term outreach component targeting broadcast viewers, informal and formal science educators, and attendees of informal science institutions. A key element of the project's outreach was *The Shape of Life* Consortium, comprising eleven aquaria members from across the country. The purpose of the Consortium was to build on and expand The *Shape of Life* series by supporting existing informal science education and promotional programs and new exhibits and programs that explore the animal kingdom in the context of body plans, phyla, and evolution. The Consortium's initiatives were ongoing and collectively expected to provide an appealing and efficient means of reaching a large audience in a cost-effective manner.

Summative evaluation reports prepared by the project's independent evaluator, Knight-Williams Research Communications (Knight-Williams), have elsewhere documented the Consortium partners' numerous and diverse marketing/promotion and educational activities involving the

---

[1] Quoted from Project Summary, National Science Foundation proposal (page A.1)

[2] As a result of the preproduction research, formative evaluation, production, and other development processes, some of these goals shifted or became further refined. To provide maximally useful feedback, the evaluation has aimed to be responsive to these subtle changes in direction.

series.[3] While Sea Studios Foundation encouraged each partner to develop its own priorities and activities on behalf of *The Shape of Life*, the Foundation also expected the partners to find ways to market and promote the series within their own membership, visitor and outreach audiences, and beyond to the local media and public community.

Building on these anticipated marketing/promotion efforts, Knight-Williams collaborated with five aquaria to solicit the reactions of a random sample of their aquaria members to the PBS broadcast of the *Shape of Life* series. The collaborating aquaria were located in geographically diverse regions of the country and included: The Seattle Aquarium, Cabrillo Marine Aquarium, Dauphin Island Sea Lab, Shedd Aquarium, and New York Aquarium.

The evaluation entailed mailing two rounds of questionnaires to large random samples of members from the collaborating aquaria. The first questionnaire arrived immediately after the first night of programming (April 2nd); A second questionnaire was sent to a separate random sample of aquaria members and arrived after the final night of programming (April 16th). All recipients were invited to complete the questionnaires regardless of whether they had watched any *Shape of Life* programming so comparisons could be made between viewers and non-viewers of the series.

This report addresses the second mail survey effort that occurred immediately following the broadcast of the final two episodes *Ultimate Animal* and *Survival Game* on April 16th. The report focuses on questionnaire data provided by both the non-viewer respondents and by viewers of two or more episodes from the series. Subsequent sections of the report present the evaluation procedure, findings, and conclusions as detailed in the Table of Contents.

[3] As part of the summative evaluation of *The Shape of Life* project, Knight-Williams Research Communications evaluated selected Consortium member events and activities as they unfolded prior to and during *The Shape of Life* series premiere on PBS in April 2002. These evaluation reports are available upon request from kwrc@att.net

Method

Knight-Williams collaborated with five aquaria from *The Shape of Life* Consortium to solicit the reactions of a random sample of their members to the series, as it aired over the course of three consecutive Tuesdays from 9-11 pm on PBS April 2nd – April 16th, 2002. Figure 1, below, presents the PBS broadcast schedule for each of the six episodes.

Figure 1 **April 2002 PBS Schedule for *Shape of Life* episodes**
Tuesday April 2nd **Origins** (featuring sponges) **Life on the Move** (featuring anemones and jellyfish)
Tuesday April 9th **The First Hunter** (featuring flatworms) **The Conquerors** (featuring crabs, bugs, and their kin)
Tuesday April 16th **Survival Game** (featuring snails, octopi, and their kin) **Ultimate Animal** (featuring sea stars and their kin)

Participating aquaria

Five aquaria participated in the evaluation effort. Table 1, below, lists the aquaria and their respective locations. The aquaria were located in geographically disperse regions, with two on the West Coast (Seattle Aquarium in the Northwest and Cabrillo Marine Aquarium in the Southwest), one located in the Midwest (Shedd Aquarium), and two on the East Coast (Dauphin Island Sea Lab in the Southeast and New York Aquarium in the Northeast).[4]

Evaluation design

The evaluation design involved mailing a questionnaire to a random sample of 550 aquaria members drawn from the five partners' membership lists.[5] The evaluators timed the mailings so that the questionnaires arrived immediately following the final night of programming (April 16th).[6] A $1 incentive and return envelope were also included with each mailing. All recipients were invited to complete the surveys so that comparisons

Table 1
Aquaria partners that participated in the evaluation

AQUARIA	LOCATION
The Seattle Aquarium	Seattle, Washington
Cabrillo Marine Aquarium	Los Angeles, California
Shedd Aquarium	Chicago, Illinois
Dauphin Island Sea Lab	Dauphin Island, Alabama
New York Aquarium	Brooklyn, New York

4 Information about the five aquaria partners can be found at the following websites:
Cabrillo Marine Aquarium http://www.cabrilloaq.org/
Seattle Aquarium: http://www.seattleaquarium.org/
Shedd Aquarium: http://www.shedd.org/
Dauphin Island Sea Lab: http://www.disl.org/
New York Aquarium: http://wcs.org/home/zoos/nyaquarium/

5 The staff at one aquaria partner preferred to keep member identity intact and requested the evaluators send the questionnaires in pre-stamped envelopes to their attention so that they could print and affix the mailing labels and then send them directly to a random sample from their membership list.

6 Knight-Williams also mailed the aquaria members a *Shape of Life* bookmark during the series premiere to apprise them of the television viewing opportunity. Recipients were not provided any additional information about the series or evaluation effort.

could be made between viewers and non-viewers of the programming.

Questionnaire

The questionnaire contained multiple question sets printed on two double-sided pages. All recipients, whether or not they watched the first night of *Shape of Life* programming, were asked about:

- Demographic and other background information concerning their science/nature television viewing habits, occupational status, and need for science understanding in their employment.
- How much, if any, of *The Shape of Life* series they viewed and their reasons for viewing or not viewing.
- Whether they had a preference for seeing *The Shape of Life* episodes aired one at a time or back-to-back as broadcast during the PBS premier.
- Whether and how they were informed about *The Shape of Life* series.
- Whether and how their local aquaria informed them about the series.
- Their knowledge of the content addressed in *The Shape of Life* relating to the methods or technologies scientists have used to learn about the rise of the animal kingdom and the classification of animals according to body plans or "blueprints."
- When they last visited their local aquarium, whether they participated in any activities at the aquarium that involved *The Shape of Life,* and what they most liked and disliked about these activities.
- Whether they purchased anything from the aquarium gift shop during their visit(s) and whether the purchase had anything to do with *The Shape of Life*.
- How likely they were to visit their local aquarium within the subsequent one-two months and the whether seeing the series influenced their plans to visit.

Respondents who had viewed programming from *The Shape of Life* series were asked about the following additional issues:

- What they liked and disliked most about the programming they viewed.
- What they felt were the most interesting facts, ideas, or concepts they learned.
- The extent to which they: Liked or disliked the programming; Perceived the content as boring or interesting; Found the presentation visually dull or exciting; Felt they learned from the programming; Found the presentation clear or confusing; and Felt the programming had too much or too little information and too much or too little explanation of scientific principles.
- How successful they felt the programming was in accomplishing a variety of informal science education goals, including: Showing that animals can be grouped according to body plans; Increasing their curiosity about animal body plans; Using animation to show the internal structure and workings of different animal body plans; Explaining the techniques scientists use to investigate the rise of the animal kingdom; Showing how animals that share the same body plan are similar to one another; Showing how animals that first lived on Earth compare to animals living today; Showing the special features or adaptations different animals have that help them survive in their habitats; Giving them a greater appreciation for the diversity of animal life on Earth; Presenting credible scientific evidence; Expanding their view of what constitutes an "animal;" and Showing scientists driven by passion and curiosity.

- How they compared *The Shape of Life* series to other nature/science series they've seen.
- How they compared the scientists featured in *The Shape of Life* to scientists they've seen in other nature/science television shows.
- Whether they discussed *The Shape of Life* series with anyone since the series began on April 2nd, and if so, what about the series they discussed.
- Whether they recommended *The Shape of Life* series to anyone, and if so, what they said about the series.
- Whether and how seeing *The Shape of Life* affected anything they thought about or did since seeing the series.
- Whether they read anything, saw anything on television, or heard anything on the radio that made them think about *The Shape of Life*.
- And, finally, whether they visited any websites that featured information about *The Shape of Life* series, and if so, what they learned or gained from the visit.

Respondent demographic and background information

A total of 49 viewers and 210 non-viewers completed questionnaires that subsequently formed the basis for this evaluation report. An additional 50 respondents[7] submitted questionnaires not used in the present analysis as the questionnaires were either largely incomplete or revealed the viewers had watched an insufficient amount of the series for inclusion in the analysis. The evaluation required that viewers watched "most" or "all" of two or more episodes from among the six that aired on PBS. Table 2, on the following page, summarizes the viewer and non-viewer demographic and other background data.

The viewer portion of the respondent sample included:

- Considerably more west coast than east coast or midwest respondents (80% vs. 20% vs. 10%).

- More females (55%) than males (45%).

- A wide range of ages, spanning 18-81 years, with a mean age of 52 years. The majority of respondents were between the ages of 30-69.

- A racial distribution that was predominately White (82%), with a small percentage of Asian (9%) and Hispanic/Latino (8%) viewers.

- A range of occupational situations. Half (51%) were employed and one-third (33%) were retired, while the remaining participants were students (6%), unemployed (6%), or homemakers (4%). Of the employed viewers, the following range of occupations were listed: instructional aide; after-school tutor, nurse, consultant, teacher, aerospace consultant, engineer, costume designer, sales/food server, security systems designer, command center analyst, graphic designer, singing trainer, manager, real estate broker, statistician, administrator, and development specialist.

[7] 22 viewers, 30 non-viewers

- Of the employed, about three-quarters (72%) felt they needed an understanding of science in their line of work, while a little over one-quarter (28%) did not.

- Many regular viewers of science nature/television programs, with two-thirds of the viewers (64%) reporting they watched science/nature programs everyday or once a week or more. The remaining viewers reported watching 2-3 times a month (22%) or about once a month (14%).

Table 2
Respondent demographic and background information

Demographic/ background factor	Categories	Viewers (n=49)	Non-viewers (n=209)
Region	West Coast (CA, WA)	80%	59%
	Mid-west (IL, MI)	10%	12%
	East Coast (AL, NY, MA)	20%	29%
Gender	Female	55%	61%
	Male	45%	39%
Age Group			
Age range		18-81	17-89
Mean		52	47
Ethnic Group	African-American/Black	0	2%
	Asian American	10%	6%
	Hispanic/Latino	8%	4%
	White	82%	88%
Occupational Status	Employed	51%	58%
	Unemployed	6%	2%
	Homemaker	4%	24%
	Retired	33%	14%
	Student	6%	2%
Need an understanding of science in employment?	Yes	72%	59%
	No	28%	41%
Frequency of Viewing Science/ Nature programs on television	Every day	12%	7%
	About once a week or more	52%	35%
	2-3 times a month	22%	30%
	About once a month	14%	19%
	Less than once a month	0%	7%
	Never	0%	1%

Chi-square analyses revealed the viewing and non-viewing respondents did not differ significantly with respect to age, gender, geographical region, or frequency of viewing science/nature shows, but the groups did differ significantly with respect to occupational status, as viewers of *The Shape of Life* were more frequently retired. [8]

[8] Occupational status: Chi square (4 df) = 19.68, p .0006;

Findings

Viewer exposure to *The Shape of Life* episodes

For each *Shape of Life* episode that aired during the April 2002 premier, viewers were asked to identify how much they watched, choosing from among the following response options: all, most, some, none, or don't remember. Table 3, below, presents the percentage of viewers that watched most or all of each episode.

Table 3
Viewer exposure to *The Shape of Life* episodes broadcast April 2002 (n=49)

	% viewers (n=49)
Tuesday April 2nd	
Origins (featuring sponges)	80%
Life on the Move (featuring anemones and jellyfish)	79%
Tuesday April 9th	
The First Hunter (featuring flatworms)	66%
The Conquerors (featuring crabs, bugs, and their kin)	69%
Tuesday April 16th	
Survival Game (featuring snails, octopi, and their kin)	82%
Ultimate Animal (featuring sea stars and their kin)	82%

Each episode was mostly or fully watched by at least two-thirds of the viewing sample. The final two episodes that aired on April 16th, *Survival Game* and *Ultimate Animal*, were watched by the highest percentage of viewers (82% each). The two episodes that launched the series on April 2nd closely followed, with *Origins* at eighty percent (80%) and *Life on the Move* at seventy-nine percent (79%). The middle two episodes broadcast on April 9th were also watched by a sizeable, albeit somewhat smaller percentage of viewers, including: *the First Hunter* at sixty six percent (66%) and *The Conquerors* at sixty-nine percent (69%).

How viewers learned about *The Shape of Life*

Viewers were asked how they found out about *The Shape of Life*, and in particular, whether they had seen, read, or heard anything about the series from their local aquaria or from any print, radio, television, internet, or conference source. Viewers were also invited to identify any other sources that informed them about the series. Table 4, on the following page, presents the different ways viewers found out about the series.

The evaluation found:

- Less than half (45%) said they found out about the series through their local aquaria. Additional information about the different ways their aquaria informed them about the series follows in the next section.

- Nearly one-fifth (18%) said they saw a television commercial or promotion on television. A couple of these viewers specified the channel as a PBS channel, while the other viewers didn't specify the channel or stated that they didn't remember the channel.

- Ten percent (10%) said they learned about the series when they received a bookmark about the series in the mail from the project's independent evaluator, as in: *Direct mail notice*.

- Ten percent (10%) said they found out about the series while channel surfing. For example:
  - *I occasionally scan television channels and stumbled upon it. I flipped it on the TV and couldn't turn away.*
  - *I watch the discovery channel most evenings with my adult children we are all nature lovers. My husband and I are wildlife photographers and are interested in all areas of wildlife. We look for programs on these subjects. We found it by channel surfing.*

Table 4
How viewers found out about *The Shape of Life*

Source	Total[9] (n=49)
Local aquarium (Newsletter, bookmark, lecture event, website, email, handout)	45%
TV promo (PBS, maybe other)	18%
Bookmark sent by independent evaluator	10%
Channel surfing	10%
Local newspaper	6%
Friend/family recommended	6%
PBS publication (magazine)	4%
PBS website	2%

- Six percent (6%) said they learned about it from their local newspaper, as in: *L.A. Times article*.

- Six percent (6%) said they learned about it from a friend or family member who recommended it, as in: *Sister told me*.

- Four percent (6%) said they learned about it from their PBS station publication, as in: *KCET Magazine*.

- Two percent (2%) said they learned about it from the PBS Website, as in*: Quite by chance. Happen to visit the PBS website the day of its first showing.*

[9] Note that the column sums in many tables will exceed the total (n) for the column if viewers offered more than one category of response.

Role of local aquaria in informing viewers and non-viewers about *The Shape of Life*

Viewers and non-viewers were asked whether and how their local aquaria informed them about *The Shape of Life*, selecting from among the following response options: Newsletter, email, website, bookmark, other handout, lecture/special event, and other. The evaluation found that 45% of viewers and only 13% of non-viewers were informed about *The Shape of Life* by their local aquaria. Table 5 summarizes how the respondents were informed about the series from their local aquaria.

Table 5
How viewers and non-viewers learned about *The Shape of Life* from their local aquaria

How informed	Viewer (n=49)	Non-viewer (n=210)
Wasn't informed	55%	87%
Newsletter	18%	7%
Bookmark	14%	4%
Lecture event	6%	1%
Website	4%	0%
Email	4%	0%
Other handout	2%	1%
Poster	2%	1%

- More than half the viewers (55%) and 87% of non-viewers said they weren't informed about the series from their local aquaria.
- Just under one-fifth (18%) of viewers and 7% of non-viewers said they received an aquarium newsletter that contained information about the series.
- Fourteen percent (14%) of viewers and 4% of non-viewers learned about the series from a bookmark provided to them at the aquarium.
- Six percent (6%) of viewers and 1% of non-viewers heard about it while attending an aquarium lecture event.
- Four percent (4%) of viewers learned about it through an aquaria website or an email announcement
- Between 1-2% of viewers and non-viewers percent each learned about it through a poster, or handout provided to them at their aquarium.

Viewer reasons for watching *The Shape of Life*

Viewers were asked to explain what attracted or drew them to *The Shape of Life*. Table 6 presents the main reasons viewers watched and the percentage of viewers selecting each reason.

Table 6
Reasons viewers watched *The Shape of Life*

Reasons	Total (n= 41)
Interested in subject matter – marine life, evolution	56%
TV promotions – looked interesting, showed great photography, raised interesting questions	24%
Channel surfing – just caught eye	17%
Lecture event (at aquaria or PBS station) made it seem exciting	17%
Generally drawn to nature programs	10%
Friend/family member recommended it	7%

The viewers who answered this question (n=41) described a range of factors that attracted them to the series, as follows:

- Just under half (56%) said they were interested in subject matter the series covered. These viewers described their subject matter interest either in general terms, as in *Subject matter interests me* or they stated a specific interest in the subjects of marine life or evolution. For example:
  - *I was interested to learn more about sea life and how the animals interact.*
  - *The subject matter -- Water sea life.*
  - *Watched because of interest in evolution.*

- About one-quarter (24%) said that they were drawn to the series as a result of encountering television promotions about it. At least half of these viewers said they were attracted to the photography shown in the promos, which they described as *incredible, beautiful,* or *compelling*. A few noted that the *questions* or *issues* raised in the promos enticed them to watch. The range of comments on this theme included:
  - *The promos for this one looked really great.*
  - *Public TV announcement. The quality of the photography was compelling.*
  - *Good ads/trailers -- Gave interesting questions, showed Incredible photography.*

- Seventeen percent (17%) said they watched because they were channel surfing and *The Shape of Life* caught their eye, as in:
  - *It caught my eye when I was channel-surfing.*
  - *I was switching channels and was fascinated by the nautilus that was being shown. I watched the rest of the show from that point on.*

- Seventeen percent (17%) said they watched because a lecture event they attended at their aquaria or PBS station got them excited about the series. All of these viewers were based in California and were referring to lecture events held by KCET and/or Cabrillo Marine Aquarium, as in: *Increased interest because of attendance at Cabrillo Aquarium event* and *Having been introduced to it because of the KCET invitation, I wouldn't have missed it for the world.*

- One-tenth (10%) said they watched because they are generally drawn to nature documentaries, as in: *I like all nature shows* and *I enjoy nature programs*

- Seven percent (7%) said they watched because a friend or family member recommended the series to them, as in: *A friend's advice* or *Recommended by my sister.*

Non-viewer reasons for not watching *The Shape of Life*

Non-viewers were asked to explain why they didn't watch the series. Table 7 presents the main reasons non-viewers didn't watch and the percentage of non-viewers selecting each reason.

Table 7
Non-viewer reasons viewers for not-watching
The Shape of Life

Reasons	Total (n= 210)
Didn't know about the series	69%
Was unable to watch at the time it aired	19%
Don't own a TV/rarely watch television	6%
The subject matter doesn't interest me	3%
Don't watch PBS/can't get the channel on my TV	2%
Forgot about it/read about it in newsletter or bookmark	2%

The evaluation found that the largest percentage of non-viewers (69%) didn't know about the series, while other reasons were listed by less than one-fifth or less of the respondents. Other reasons were mentioned by one-fifth or less of the non-viewers as follows:

- One-fifth (19%) said they were unable to watch at the time it aired.
- Six percent (6%) said they didn't own a television or rarely watch TV.
- Smaller percentages of viewers aid they didn't watch because: The subject matter didn't interest them (3%); They don't watch PBS or can't get the channel on their TV (2%), or they forgot about it but read about it in newsletter or bookmark sent by the evaluator (2%). Other responses by individual viewers included: *1) Out of town; 2) prolonged family illness; 3) Taped it, haven't watched yet; and 4) I felt that this series would be pushing evolution and would not be worth watching*.

Viewer and non-viewer preferences for how *The Shape of Life* episodes are broadcast

Viewers and non-viewers were asked for feedback on how *The Shape of Life* six one-hour episodes were broadcast, and in particular whether they'd prefer viewing the episodes one at a time or back-to-back as featured in the April broadcast.

Table 8
Viewer and non-viewer preferences for how *The Shape of Life* episodes are broadcast

Viewer preferences:	Viewers (n=42)	Non-viewers (n = 176)
One episode at a time	48%	38%
Two episodes back-to-back	40%	34%
No preference	12%	28%

As Table 8 to the right shows, respondents offered differing opinions on this issue, although the largest percentage of both viewers and non-viewers preferred to see the episodes one at a time (48% and 38% respectively). A somewhat smaller percentage in each case (40% and 34%) stated a preference for seeing the episodes broadcast back-to-back. Finally, 12% of viewers and 28% of non-viewers indicated no preference either way.

Viewer overall appeal ratings for *The Shape of Life*

Viewers were asked a series of questions about the overall appeal of *The Shape of Life* programming they viewed. Using a scale of 1 to 5, viewers were asked to rate several program elements, including how much they: Liked the programming; Perceived the content as boring or interesting; Found the presentation visually dull or exciting; Learned from the programming: Found the storytelling boring or interest, Found the presentation clear or confusing, Felt the programming had too much or too little information, and Felt the programming had too much or too little explanation of scientific principles. Viewers were also invited to explain their ratings in a separate space.

The viewers' mean ratings for the eight programming elements are presented in Table 9 below.

Table 9
Viewer overall appeal ratings for *The Shape of Life* (n=49)

	1 2 3 4 5	
Visually dull	4.8	Visually exciting
Disliked it	4.7	Liked it
Boring content	4.7	Interesting content
Confusing presentation	4.6	Clear presentation
Boring storytelling	4.6	Interesting storytelling
Learned nothing	4.5	Learned a lot
Not enough information	3.3	Too much information
Not enough explanation of scientific principles	3.3	Too much explanation of scientific principles

As Table 9 shows, viewer reactions to *The Shape of Life* across all five programming elements were extremely positive. Viewers generally concurred that they: liked *The Shape of Life* programming, learned from it, found the content interesting, encountered a visually exciting presentation, felt it had the right amount of information and explanation of scientific principles.

The specific mean findings for each item follow, accompanied by viewer comments where applicable:

- Viewers overwhelming concurred that the programming was visually exciting (mean, 4.8).
- Viewers generally liked *The Shape of Life* programming (mean 4.7).
- Viewers felt *The Shape of Life* content was interesting (mean, 4.7).

- Viewers generally felt the programs' storytelling approach was interesting (mean, 4.6). Only one viewer who was less enthusiastic about the series storytelling approach elaborated on this issue, noting that he perceived the programming to *Somewhat drawn-out. Too repetitive -- showing flat worms over and over as an example*.

- Viewers felt the presentation was generally clear (mean 4.6), with just one viewer taking issue with the sound mixing aspect of the program: *Sound mixing is terrible! The all important narrative is sometimes unintelligible!*

- Viewers felt they learned something new from the programming (mean, 4.5), with just one viewer qualifying: *Yes, but I always want to know more*.

- Viewers felt the amount of information presented in the series was about right (mean, 3.3).

- Viewers felt the amount of explanation of scientific principles was about right (mean, 3.3).

What viewers most liked about *The Shape of Life*

Viewers were asked to describe what they most liked about *The Shape of Life* programming they viewed. Table 10, below, summarizes the categories of responses mentioned most frequently and the number of viewers citing each response.

Table 10
What viewers most liked about *The Shape of Life*

Liked:	Total (n=48)
Cinematography – *incredible, stunning, beautiful, colorful, unlike anything I've seen before*	52%
Storytelling/overall presentation – *smooth flow, coherent, clear, imaginative*	36%
Information about the diversity/origins of animal life	32%
Animation – *excellent, useful, explanatory*	19%
Opportunity to see animals I wouldn't otherwise see	6%
Science information – *new, fresh*	6%
Narration – *good voice*	6%
Music – *nice*	6%
Liked overall/in general	6%

Viewers appreciated a variety of programming elements about *The Shape of Life*, as follows:

- More than half (52%) praised the cinematography. These viewers consistently used adjectives like *beautiful, incredible, stunning*, and *colorful* to describe the cinematography. A few viewers commented that the cinematography was unlike anything they encountered before. The range of comments on this

theme included:

- More than one-third (36%) particularly liked the storytelling approach or how *The Shape of Life* presented the subject matter it covered. These viewers praised the presentation as *easy to understand, smooth flowing, creative,* and/or *story-like*. The range of comments on this theme included:

- Just under one-third (32%) liked that they learned about the diversity and/or origins of animal life on Earth, as in:

- About one-fifth (19%) praised the animation/graphics used in the series and described them as *excellent* or *useful for explaining concepts presented*, as in: *Excellent television graphics. CAD approach was great idea or Excellent imaging* and *Good use of graphics, overlays for explanations.* Six percent (6%) liked the scientists featured in the series. Viewers mentioning this theme liked that the scientists were different in each segment or were fun characters to watch, as in: *The different scientists for each segment* and *Scientists were fun characters.*

- Six percent (6%) appreciated the opportunity to see animal life forms they wouldn't otherwise have an opportunity to see, as in: *I had never seen a live nautilus before and found it amazing.*

- Another six percent (6%) said they liked that the science information presented was new and fresh, as in: *The information is new and fresh. The fact that this is true and isn't always known.*

- Another six percent (6%) particularly liked the narration, noting that Peter Coyote's voice was *very good.*

- Another six percent (6%) liked the music, describing it as *very nice*.

- And finally, six percent (6%) said they liked everything about the programming they watched without elaborating further, as in: *Everything. Overall shows were excellent.*

What viewers disliked about *The Shape of Life*

Viewers were asked to describe what, if anything, they disliked about *The Shape of Life* programming they viewed. Table 11, below, summarizes the categories of responses most frequently mentioned and the number of viewers citing each response.

Table 11 What viewers disliked about The S*hape of Life*	
Disliked:	**Total (n=48)**
Nothing – liked it all	64%
The timeslot – *too late, back-to-back broadcast is too much*	14%
Repetitive, lost track of "storyline"	8%
Too verbal, too much monologue	6%
Insufficient science background information provided	6%

The evaluation found that:

- About two-thirds (64%) felt there wasn't anything they disliked, with many of these viewers instead adding general praise for *The Shape of Life*, such as: *Liked it all.*

- Fourteen percent (14%) took issue with the timeslot the program aired, with about half of these viewers complaining that the broadcast time (9-11 pm) was *too late* and half complaining about the program being aired in a back-to-back fashion, as in: *Two episodes back-to-back is too long to watch in one sitting.*

- Eight percent (8%) felt that the programming was at times repetitive, with a couple of viewers elaborating that they lost track of the storyline as a result. For example: *Repetitive shots. Couldn't always follow where we were in the "story."*

- Six percent (6%) felt that the programming at times was too verbal or had too much monologue, as in: *Too much verbal monologue.*

- Six percent (6%) felt the programming lacked sufficient science background information, with one of these viewers qualifying that she was teacher and that she felt her middle school students might need more explanation of the featured science concepts: *May have been a little fast for lower level viewers, may need more background for students, may be over the head of some, will have to stop and give more explanation of science concepts to students*

- Other dislikes mentioned by individual viewers touched on the following issues: that there was too much focus on the scientists as individuals, that the narration was overpowered by the soundtrack, and that the series at times featured too little or too much footage of specific kinds of animals. Their comments included: *1) Narrator sound is over-powered by the rest of the soundtrack. Many times we are unable to tell what the narrator says; 2) A little too much focus on the present day scientists as individuals; 3) Annelids- too much fossil footage. Not enough worm video; and 4) Needed more tropical biota- corals in particular.*

Viewer and non-viewer interest in learning about the rise of the animal kingdom

Viewers and non-viewers were asked to rate their interest in learning about the rise of the animal kingdom on a scale of 1 to 5. The evaluation found that viewers of the series expressed a significantly higher level of interest in this subject matter than did non-viewers.[10]

All but one viewer assessed themselves as very (63%) or moderately (17%) interested. The mean rating for the item was 4.6. Only one viewer reported being somewhat disinterested in the subject. Meanwhile, non-viewers assessed themselves as somewhat less interested in learning about the rise of the animal kingdom. One-quarter (27%) rated themselves as very interested while two-fifths (39%) were moderately interested . One-quarter (23%) felt neutral about the topic while about one-tenth was moderately disinterested (7%) or not at all interested (2%)in the topic. The mean rating for the item was 3.8.

Viewer self-assessed knowledge about the rise of the animal kingdom

Viewers and non-viewers were asked to rate their knowledge about the rise of the animal kingdom on a scale of 1 to 5. The evaluation found that viewers felt significantly more knowledgeable about this topic than non-viewers.[11]

Viewers were somewhat divided on this issue however, with less than half describing themselves as very (10%) or moderately (33%) knowledgeable, more than one-third (39%) describing themselves as somewhat knowledgeable, and nearly one-fifth (18%) describing themselves as knowing very little. The mean rating for the item was 3.3.

---

[10] t-Test (122 df) = 6.868, p . 0001. Whether this higher level of interest can be attributed to viewing the series cannot be determined however with the current evaluation design.

[11] t-Test (74 df) = 4.244, p . 0001 Whether this higher level of self-assessed knowledge can be attributed to viewing the series cannot be determined however with the current evaluation design.

Non-viewers were also somewhat divided on this issue, but overall felt less knowledgeable about the topics than did viewers. Less than one-fifth was very (2%) or moderately (16%) knowledgeable about the topic, two-fifths (42%) felt somewhat knowledgeable, and about two-fifths felt they had little (31%) or no knowledge (8%) on the topic.

What viewers felt they learned from *The Shape of Life*

Viewers were asked to specify the most interesting things they learned from watching *The Shape of Life*. Table 12 summarizes the categories of responses most frequently mentioned and the number of viewers citing each response.

Table 12
Most interesting things viewers felt they learned

	Total (n=34)
Facts about animal behavior: How animals (like starfish, flatworms, octopi, and sponges) feed, mate, move, and defend	59%
Information about evolution, origins of animal life on Earth.	41%

All the viewers who answered this question (n=34) felt they learned at least one thing of interest from *The Shape of Life*. The kind of learning they discussed fell into two main categories, as follows:

- More than half (59%) were interested in facts learned about animal behavior. Citing specific animals featured in the series (e.g., sponge, nautilus, seastar, octopus, flatworm, and squid), these viewers were most frequently interested in the feeding, mating, mobility, and defensive behaviors featured in the series. The range of comments on this theme included:
  - *That sea stars eat snails.*
  - *The feeding, breathing of original sponges.*
  - *The vast array of different sea stars. Watching the abalone escape from the octopus.*
  - *Breeding habits that I was unaware of.*
  - *The methods of survival.*
  - *How sponges ate. That nautilus can swim in any direction. How a squid propels itself backward. How an octopus can change colors.*
  - *Defensive adaptation of mollusks. How it would feel like to be a muscle prayed on by disaster.*
  - *Flatworms, worms and how they move. I learned a lot of new information about the starfish and squids. The science behind how octopi change color. This is coming from someone who watches a lot of natural science programming.*

- Forty-one percent (41%) were particularly interested in the information they learned about the origins and evolution of animal life on Earth. Most of these viewers gave examples of specific new information they learned, like about the sponge being the first animal on Earth or the flatworm being the first predator. A few viewers who reflected more broadly about the evolutionary process elaborated that they had discovered the process to be *logical, incredible*, or *multi-directional.* Finally, a couple of viewers were particularly interested to learn about the evolution of animal body plans. The range of comments on this theme included:
  - *The total flow of evolution from single celled to high-level animal life is logically laid out. Now I know why people act the way they do.*
  - *How really ancient life is and how it developed from such simple shapes and types.*
  - *Showing how sponges were the first animals. The evolution of life is incredible.*
  - *Things about how life evolved, like the first animals that walked on land. Flatworms are considered first predator. They were one of the first animals to have central nervous system.*
  - *Transition between field creatures and flatworms.*
  - *The evolutionary theories of the echinoderms was intriguing. I learned a great deal about the organisms even though I have studied them for many years while diving.*
  - *How the body plans evolved.*
  - *Sponges were the first animals. Cnidarians invented willed motion with the invention of muscles and nerve wiring. Flat worm ancestors were the first hunters. The animal arms race results in greater adaptation and evolution. Evolution went in many different directions, such as with echinoderms and can achieve complex behavior seemingly simple organisms.*

- A few individual viewers pointed to other things they learned of interest, including: 1) *The Stories behind science; 2) The community concern about the Scottish flatworm problem; 3) How much we do not know about our oceans; and 4) All living things play a vital role in keeping Earth alive, even the lowly worms.*

Knowledge relating to core science information and concepts presented in *The Shape of Life*

To estimate, in as efficient a way as possible, viewer acquisition of some of the major science information and concepts presented in the series, viewers and non-viewers were each presented with two questions about animal body plans and the methods scientists use to learn about the rise of the animal kingdom. The results from these assessments are reviewed below.

Knowledge of methods used to study the rise of the animal kingdom

To estimate knowledge of the methods scientists use to study the rise of the animal kingdom, viewers and non-viewers were asked to list the kinds of methods scientists use to study the rise of the animal kingdom and to list as many methods as possible. Table13 presents the methods most frequently listed by each group.

Table 13
Viewer and non-viewer knowledge of
The methods used to study animal evolution

Non-viewer (n=120)	Methods used to study animal evolution:	Viewer (n=42)
33%	Fossil excavation and analysis	68%
23%	Genetic testing/DNA analysis	60%
10%	Field research – observe animals alive today for clues to the past	37%
10%	Conduct lab-based experiments	37%
5%	Compare and classify animals according to characteristics	31%
5%	Use computer technologies	25%
2%	Underwater photographic techniques	19%
15%	Don't know	0%
1.0	Average number of methods listed per respondent	2.2

All of the viewers (100%) were able to list at least one method that scientists use to study the rise of the animal kingdom, with most generating 2 or more methods (mean 2.2). Meanwhile, a little more than four-fifths of non-viewers (85%) listed at list one method, but most generated not more than 1 method (mean 1.0).

Viewers' and non-viewers responses generally fell into about seven different categories. The following section summarizes the percentage of respondents offering a method in each category. Across every category, viewers listed 2-3 times more methods than non-viewers, as follows:

- Fossil excavation and analysis: More than two-thirds of viewers (68%) listed a method that involved fossil excavation/analysis compared to one-third of non-viewers (33%)

- Genetic testing/DNA analysis: Nearly two-thirds of viewers (60%) mentioned genetic testing or DNA analysis, compared to one-quarter (23%) of non-viewers.

- Field research – observe animals that live today for clues to the past: Nearly two-fifths of viewers (37%) mentioned field research, particularly involving the observation of animals that live today for clues to the past, compared to 10% of non-viewers.

- Conduct lab-based experiments: Nearly two-fifths of viewers (37%) said that scientists could conduct lab-based experiments to study animal evolution, compared to 10% of non-viewers.

- Compare and classify animals by characteristics: Nearly one-third of viewers (31%) said that a method for studying early animal life involved categorizing or classifying animals, compared to 5% of non-viewers.

- Use of computer technologies: One-quarter of the viewers (25%) mentioned using computer technologies in the study of early animal life on Earth, compared to 5% of non-viewers.

- Underwater photographic techniques: One-quarter of the viewers (19%) mentioned the use of underwater photographic techniques, compared to 2% of non-viewers.

Knowledge of animal body plans

Viewers and non-viewers were informed that scientists can classify animals according to a limited number of body plans or "blueprints." They were then asked to think of any animal and list the features the animal has in common with other animals of the same body plan.

Two-fifths of viewers (41%) and one-tenth (10%) of non-viewers were able to identify an animal and then correctly describe at least one body plan feature the animal had in common with other animals sharing the same plan. The specific findings for each group of respondent follows:

Viewer findings:

Two-fifths of viewers (41%) were able to identify an animal and then correctly describe at least one body plan feature it shared with other animals sharing the same plan. When choosing an animal, most viewers selected invertebrates, which were a primary focus of the series. Note however that none of the viewers used phylum terminology in their answers, but rather simply listed the animal of choice, followed by the characteristics they perceived it shared with other animals. The evaluation further found:

- About two-thirds specifically focused on the seastar or other echinoderms such as the sea cucumber or sea urchin. These viewers mentioned a range of body plan features the animal

shared with other echinoderms, including: an internal skeleton, a five-part symmetry, and a special fluid-filled system that operates the tube feet.[12]

- About one-quarter focused on the lobster as their animal of choice. These viewers also mentioned a range of body plan features the animal shared with other arthropods, including: a hard exoskeleton, the possession of jointed appendages, and a segmented body.

- About one-fifth focused on the worm. These viewers also mentioned a range of body plan features the animal shared with other arthropods, including: a description of bilateral symmetry, a centralized nervous system, a head and tail, and no body cavity or hard skeleton shared with other flatworms.

The range of viewer answers included:

- *Sea cucumber and urchin: Body plan in fives, mouth, water vascular system, tube feet.*
- *Worm bilateral symmetry, central nervous system.*
- *Starfish: 5 part body plan, Tube feet, Bony plates instead of skeletons.*
- *Lobster: jointed legs, exoskeleton.*
- *Starfish: Spiny skin. Body parts in fives. Slow-moving. Mouth on bottom of organism.*
- *Shrimp: Exoskeleton. Antennae. Jointed appendages.*
- *Mammal: Bilateral body plan with all chordates. Back bones, nerve cords.*
- *Starfish: radial symmetry, open circulatory system, nerve ring, retractable stomach, digestive enzymes, tube feet, armor plating.*

Non-viewers

One-tenth (10%) of the non-viewers were able to identify an animal and then correctly describe at least one body plan feature it shared with other animals of the same plan. Most non-viewers, however, did not focus on body plan attributes perse, but rather characteristics particular to the animal they listed, with the majority focusing on exterior physical (e.g., fur, skin) and/or behavioral (e.g., intelligence, mobility, feeding) characteristics. Most listed mammals as their animal of choice. The range of non-viewer responses included:

- *Bird: feather, bones, nesting.*
- *Horse: hooves, hip structure, skull shape.*
- *Dog: 4 legs, tail, walks on all fours, covered with fur, acute sense of smell and hearing.*
- *Feline/rodent: Furry with a slight temper. A shaved, fat animal. Likes to scavenge.*
- *Mammal: Bilateral skeleton, back bones, nervous system, care for young.*
- *Monkey: hairy, backbone, give birth to live young.*
- *Humans: opposable thumbs, care for young, intelligent.*
- *Dinosaurs: eggs, 3 toes.*
- *Lions: herding, nurturing, feeding.*
- *Ape: ability to walk upright, hand-tool use, forward eyes, live birth, hair, group cooperation.*
- *Dog: large paws, wet nose, usually walk on all four's however can stand on back legs, hibernation, and very god sense of smell.*

[12] Note however that none of the viewers used the term echinoderm or any other phylum name in their responses.

How viewers compared *The Shape of Life* to other nature/science series

Viewers were asked to compare *The Shape of Life* series to other nature/science series they'd seen. Table 14, below, summarizes the categories of responses most frequently mentioned and

Table 14
How viewers compared The *Shape of Life* to other nature/science series

***The Shape of Life* offers:**	**Total (n=33)**
Superior cinematography – *wonderful, fabulous, high quality*	48%
More information/education	32%
Better presentation – *easier to understand/relate to, well-organized, engaging*	24%
Better animation/computer graphics	10%
Scientists that are easier to relate to/understand	8%
More attention to marine life	8%
Comparable programming to other science/nature series	6%

the number of viewers citing each response. Just about all the viewers who answered the question (n=33) said they felt *The Shape of Life* compared *very favorably* or was *much better* than other nature/science programs they've seen. The evaluation found:

- Just about half (48%) felt *The Shape of Life* featured superior cinematography, compared to other nature/science shows. These viewers used adjectives like *fabulous, wonderful,* and *superior quality* to describe the difference. One viewer further specified that the camera shots in *The Shape of Life* were *dynamic and different,* while another specified liking the *Wonderful out-of-town-DNA-lab example.*

- About one-third (32%) felt *The Shape of Life* was more informative or educational than other nature/science shows they've watched. For example:
  - *Superior in scope of the information. More like a teaching series. Covered the subjects really well. A very fundamental set of questions are asked/well answered*
  - *By far the best I've seen. Probably more inclusive and informative.*
  - *Much more factual than big cat/ crocodile programs. More informative and in greater depth than others!*
  - *I would rate it on par, but slightly more educational to the Blue Planet series from BBC/Discovery Channel. Both series being very entertaining and fun to watch though.*

- About one-quarter (24%) felt *The Shape of Life* did a better job of presenting the information it covered. These viewers typically explained that they felt the series was: easier to understand or relate to, better organized, and/or more engaging. The range of comments on this theme included:
  - *Better--more engaging/interesting rather than documentary-like. The direction was movie quality.*
  - *One of the best I have seen on these elusive creatures. It was very professional and designed to engage, make learning fun.*
  - *Reminds me of first series on this "Life on Earth" with attention brought to bringing scientific concepts to the masses in a way we can relate to-wonderful.*
  - *Superior in fundamental organization of the information.*
  - *Excellent. I really enjoyed it. I enjoyed how each episode fit together to tell a story about animal evolution. Different to other series in that each episode could stand on its own. I am excited about acquiring the CD so that I can use parts of it to teach.*

- Twelve percent (12%) preferred the animation and computer graphics featured in *the Shape of Life,* noting that series offered *superb animation* or *greater use of computer animation*. One viewer elaborated that the computer graphics used in the series helped communicate content presented, as in: *The computer graphics really helped enhance the understanding of the material.*

- Eight percent (8%) felt they preferred the scientists featured in *The Shape of Life*, and described them as easier to relate to and understand, as in: *Scientists interviewed were informative and enthusiastic but used language non-scientists could understand.*

- Eight percent (8%) felt *The Shape of Life* stood out given the amount of attention it gave to marine life, as in: *Great amount of sea life* and *It is the only one with so much underwater pictures.*

- Six percent (6%) were generally neutral about the issue. These two viewers stated that they felt *The Shape of Life* was more or less comparable to other nature/science shows they watched. Their comments included:
  - *Pretty similar. Maybe not as visually vibrant as some Nova tropical footage.*
  - *About the same. This program did OK, but many such programs tend to let dramatic music and sound effects obscure the narration.*

- Other individual viewers mentioned additional ways they felt *The Shape of Life* was preferable to other nature/science shows, which included: *1) Committed to evolution viewpoint; 2) Not as cheesy lines; and 3) Great Science.*

How viewers compared *The Shape of Life* scientists to those appearing in other nature/science series

Viewers were asked to compare the scientists that appeared in *The Shape of Life* to scientists in other nature/science series they'd seen. Among the viewers to answer this question (n=30), the majority (80%) said they felt *the Shape of Life* scientists compared favorably. The remaining viewers felt the scientists were comparable (10%) or did not compare as favorably to scientists they've viewed in other nature/science shows (10%).

Table 15, below, summarizes the categories of responses most frequently mentioned and the number of viewers citing each response.

Table 15
How viewers compared *The Shape of Life* scientists to scientists in other nature/science shows

***The Shape of Life* scientists are:**	**Total (n=30)**
More enthusiastic, passionate	27%
More down to earth, real, less arrogant	27%
More diverse – *included women, disabled, minorities*	13%
Better speakers, easier to understand	13%
More knowledgeable, leaders in field	10%
Comparable, not much different	10%
Less preferable – too much personalization	10%

Viewers' specific preferences are reviewed below.

What viewers preferred about scientists in *The Shape of Life*

As stated above, the majority of viewers (83%) felt the scientists featured in *The Shape of Life* were preferable to those seen in other nature/science programming. In terms of what viewers preferred:

- More than one-quarter (27%) felt *The Shape of Life* scientists were more enthusiastic or passionate than those featured in other nature/science shows. For example:
  - *It was really great to see scientists talk about their research and be so enthusiastic.*
  - *Showed more enthusiasm and passion on the subject.*
  - *The enthusiasm of the people for their job is a real educational tool as we prepare students to pick a field of study.*
  - *I felt that I got to know more about their passion and excitement for science.*

- More than one-quarter (27%) felt they were more personal, down-to-earth, or less arrogant, as in: *It seemed that all the scientists featured were just as expert as those in other series, yet they appeared to be more interesting, real, less arrogant.*
  - *I like the fact that they are real people who don't fit the image of a "scientists." Students believe all of us are dorks and don't have real lives. We were much more "fun" and portrayed as real people- not nerds, not members of an elite club.*
  - *More info about the people is great. Less showmanship than in other shows..*

- Thirteen percent (13%) felt that they were more diverse, and in particular, included more women, disabled, and minority scientists than have other nature/shows they've seen. For example:
  - *A really nice variety of scientists It is great to see women in leadership roles.*
  - *Diversified group of scientists from many corners of the world. I was disappointed to find no Asian scientists from such major countries like India, China, and Japan. You chose a lot of females and foreign and even handicapped scientists.*

- Thirteen percent (13%) felt they were better-spoken, or easier to understand, as in *Wonderful orators in science. Used language non-scientists could understand*.

- One-tenth (10%) felt that they were more knowledgeable and advanced in their fields compared to scientists featured in other shows, as in: *" They are very knowledgeable. More leaders in their fields.*

- Several more viewers preferred additional attributes about the scientists featured in *The Shape of Life*, though their reasons varied, as follows: *1) The scientists featured were truly field scientists which was refreshing. Its tough to watch a bookworm explain ideals and facts; 2) I found it interesting that not all the scientists featured stories that had "happy endings" but at least the outlook was always helpful; 3) Scientific honesty; 4) more sciencey, very interesting*.

What viewers felt was comparable

Among the 10% of viewers who felt *The Shape of Life* scientists were comparable to scientists in other nature/science shows they'd seen, only one elaborated, as follows: *Similar. I think the trend is to show scientists as regular people who happen to have a passion for a particular topic.*

What viewers preferred about scientists in other nature/science shows

Among the 10% of viewers who felt *The Shape of Life* scientists were less preferable to scientists featured in other nature/science shows they'd seen, one didn't care for the personalization of the scientists featured in *The Shape of Life*, as follows: *They seemed to be more "personalized." I want to know where the animals are located. But I don't need to know who the people are*. One other viewer took issue with a paleontologist[13] in Episode 4: *Explosion of Life*, noting that he

[13] Although the viewer didn't cite the scientist by name, the viewer may have been referring to the paleontologist Desmond Collins.

was too academic and didn't have an audience connection: *The Paleontologist did not come across that well in Annelids. Need to be part of the community- not so academic. E.O. Wilson and others better connected with audience.*

Viewer assessment of the success of *The Shape of Life* in accomplishing a variety of informal science education goals

Viewers were asked to rate how successful they felt *The Shape of Life* was in accomplishing a variety of informal science education goals for them personally. They were asked to rate the programs' success in meeting eight specific goals, using a scale of 1 (not at all successful) to 5 (very successful). The viewers' ratings are presented in Table 16.

Table 16
Viewer assessment of the success of *The Shape of Life* in accomplishing various informal science education goals (n=48)

Goals	Not successful 1	2	3	4	Very successful 5
Showing the special features or adaptations different animals have that help them survive in their habitats.					4.6
Showing that animals can be grouped according to body plans.					4.6
Using animation to show the internal structure and workings of different animal body plans					4.6
Presenting credible scientific evidence.					4.5
Giving me a greater appreciation for the diversity of animal life on Earth.					4.5
Showing how animals that share the same body plan are similar to one another.					4.4
Showing scientists driven by passion and curiosity.					4.4
Showing how animals that first lived on Earth compare to animals living today.					4.3
Explaining the techniques scientists use to investigate the rise of the animal kingdom.					4.2
Expanding my view of what constitutes an "animal."					4.2
Increasing my curiosity about animal body plans.					4.1

The evaluation found that:

- All the viewers (100%) felt the programming successfully showed the special features or adaptations different animals have that help them survive in their habitats.

- Nearly all (95%) felt the programming successfully showed that animals can be grouped according to body plans. Just two viewers were neutral about this issue, but didn't elaborate as to why.

- Nearly all (92%) felt the programming successfully used animation to show the internal structure and workings of the first animals that lived on earth. Just a few viewers (7%) were neutral on this issue, but didn't elaborate as to why.

- Nearly all (92%) felt the programming presented credible scientific evidence. Just a few viewers (8%) were neutral on this issue, but didn't elaborate as to why.

- Nearly all (92%) felt the programming gave them a greater appreciation for the diversity of animal life forms on Earth. Just a few viewers (8%) were neutral on this issue, but didn't elaborate as to why.

- Nearly all (92%) felt the programming successfully showed how animals that share the same body plan are similar to one another. Just a few viewers were neutral on this issue (5%) or somewhat disagreed (3%), but didn't elaborate as to why.

- Nearly all (92%) felt the programming successfully showed how animals that first lived on Earth compare to animals living today. Just a few viewers were neutral on this issue (8%), but didn't elaborate as to why.

- Most (84%) felt the programming successfully showed scientists driven by passion and curiosity. Several viewers, however, were neutral on this issue (12%) while one somewhat disagreed (2%). The viewer in disagreement elaborated that a scientist featured in the Episode 4: *Explosion of Life* episode *seemed boring,* but didn't explain further.[14]

- Most (85%) felt the programming successfully explained the techniques scientists use to study the origins of animal life, while fifteen percent (15%) were neutral about this issue but didn't elaborate as to why.

- Most (82%) felt the programming expanded their view of what constitutes an "animal." Several viewers however (15%) were neutral on this issue and one (2%) disagreed, but none elaborated as to why.

- Three-quarters (75)% felt the programming increased their curiosity about animal body plans, while one-quarter (25%) were neutral about the issue, but didn't elaborate as to why.

[14] Although the viewer didn't name the scientist, this same viewer did not favorably portray the paleontologist in the same episode (likely Desmond Collins) in another questionnaire response.

Viewer discussions with others about *The Shape of Life*

Viewers were asked whether they had discussed *The Shape of Life* series with anyone since the series began on April 2nd. About three-quarters (73%) said they had talked to another person(s) about the series while just over one-quarter (27%) said they had not.

What viewers discussed

Viewers who had discussed the series with another were then asked to describe what about the series they discussed. Table 17 summarizes what viewers most frequently discussed about the *The Shape of Life*.

Table 17
What viewers discussed about *The Shape of Life*

Viewers discussed:	**Total (n=30)**
Animal behaviors shown in the series – *as interesting, fascinating*	47%
The evolution content (The "evidence" presented, how life forms developed over time, the diversity of animal life that has resulted).	37%
The cinematography – *as excellent, amazing, high-quality, beautiful*	20%
The overall presentation or storytelling approach – a*s stimulating, exciting, interesting, and engaging*	13%
The overall appeal/encouraged family, friends, co-workers to watch	13%
Animation, timelapse – *as high quality, excellent*	10%

Viewers who had discussed the series with another (n=30) said they discussed the series with at least one other person, most typically a friend, family member, or co-worker. All but one viewer discussed the series in positive terms. Most notably:

- Nearly half (47%) the viewers who discussed the series with another talked about specific animal behaviors featured in the series. Most frequently these viewers talked about *interesting* or *fascinating* behaviors depicted in the show involving sponges, flatworms, and echinoderms (echinoderms were mentioned as a group, no specific echinoderms were named). Among the animal behaviors discussed, these viewers most frequently discussed the predatory behavior of flatworms and sponge pumping or mobility. For example:
  - *That sponges move about and have similar DNA to us. Fascinating.*
  - *It's interesting that flatworms are hunter/killers and evolved that way.*
  - *Flat worms. Predators. Sponge as animal that pumps water.*

- More than one-third (37%) talked about the evolutionary content of the series. These viewers most frequently discussed the evolution evidence concerning how animal life

evolved over time, and the diversity of animal life that has resulted. The range of comments on this theme included:

- *Friends of mine that are interested in animals. We talked about how life was created on Earth and how development has evolved through time.*
- *Evidence for evolution. How the oldest life forms developed.*
- *Remarkable gravitation from first creatures to fish, to vertebrates. The diversity of animal life.*
- *I discussed the genetic evidence leading to the animal eve. And the fascinating other firsts such as "the first hunter."*

- One-fifth (20%) discussed the series cinematography, describing it as excellent, amazing, high-quality or beautiful, as in: *The photography is amazing* and *photographic excellence*.

- Thirteen percent (13%) discussed the series overall presentation or storytelling approach, describing it as stimulating, exciting, interesting, and engaging. For example:
  - *The whole was so beautifully presented, stimulating and exciting.*
  - *Presentation of material. Had something for many learners.*
  - *The "story" was fascinating and the overall work is so engaging.*
  - *Its interest level and its excellence.*

- Another thirteen percent (13%) discussed the overall appeal of the series, and specifically encouraged friends, co-workers, or family members to watch the series, as in: *I've told all my friends how incredible it is—I seriously think everyone should watch it* and *Encouraged seeing it.*

- Ten percent (10%) discussed the animation or time-lapse photography used in the series, describing it as high quality or excellent: *The high quality of the animation* and *Excellent use of animation, time-lapse photography.*

Viewer recommendations about *The Shape of Life* to others

Viewers were asked whether they had recommended *The Shape of Life* series to anyone. About three-quarters (73%) said they had recommended the series to a friend, family, or co-worker while about one-quarter (27%) had not.

What viewers recommended

Viewers who had recommended the series to another were then asked to describe what about the series they recommended. Table 18 summarizes what viewers most frequently recommended.

Table 18
What viewers recommended about *The Shape of Life*

Recommended the:	Total (n=30)
Overall presentation – *stimulating, exciting, beautiful, well-done*	40%
Program overall as a good animal/nature program	32%
Cinematography – *spectacular, excellent*	16%
Animation – *breathtaking, wonderful*	12%
Information presented on invertebrates	12%
Information presented about evolution	12%

Among the viewers who recommended the series (n=30) to a family member, friend, or co-worker:

- Forty percent (40%) recommended the overall presentation. These viewers described the presentation as *beautiful, stimulating*, *exciting* and *well-done*. For example:
  - *It had an excellent presentation.*
  - *That it was well done and awe inspiring*
  - *The whole was so beautifully presented, stimulating and exciting.*

- About one-third (32%) said they recommended the series as a good and interesting animal/nature show. Comments on this theme included: *I highly recommended it to co-workers and friends. Told them it was good animal shows and to watch* and *It's good nature programming. They must see the remaining episodes.*

- Sixteen percent (16%) recommended the cinematography, describing it *Spectacular photography* or *Excellent photography.*

- Twelve percent (12%) recommended the animation, describing it as *Breathtaking animations* and *Wonderful computer graphics.*

- Another twelve percent (12%) recommended the information presented on invertebrates. Viewer comments on this theme included:
  - *Its educational about inverts.*
  - *One of the best series on these elusive and misunderstood creatures I have seen. The invertebrates and echinoderms have always been a mystery. The series was very interesting for those of us who have been curious about the creatures involved.*

- Another twelve percent (12%) recommended the information presented about evolution, as in:
  - *It had new knowledge incorporated from the field of biology, genetics, and paleontology to tell the story of animal life on earth.*
  - *Very informative about roots of animal life.*

Other elements recommended by individual viewers focused on: the narration, *The Shape of Life* website, and the fact that the featured scientists speak English, as follows: 1) *The scientists speak English; 2) Also that the web-site was amazing; 3) Peter Coyote's narration.*

Influence of *The Shape of Life* on viewer thoughts and actions

Viewers were asked whether seeing *The Shape of Life* affected anything they thought about or did since seeing the series. More than half (56%) said the series had affected them in some way, while forty-four percent (44%) said it had not. Table 19 presents the kinds of influences viewers most frequently described.

Table 19
Influence of *The Shape of Life*
on viewer subsequent thoughts and actions

Influences on viewer thoughts/actions:	Total (n=20)
Thought about the animals/animal body plans in the series	20%
Felt greater appreciation for animal life/biodiversity	20%
Reflected on the origins of life and evolution	15%
Thought about marine biology as a career	15%
Developed educational plans for using the series	10%

The viewers who reported that the series had influenced their subsequent thoughts and actions (n=20) elaborated as follows:

- One-fifth (20%) said they thought about specific animals or animal body plans featured in the series, as in:
  - *Have been thinking a lot about sponges- want to learn more about their niche.*
  - *Pondered how the primitive "hardwired" bilateral nervous system gave the ability to "steer" which gave that layout such a giant advantage that dominant bilaterals then prevailed through time.*
  - *Comparing of animals and their body plans. I'd like to search out more detail and learn about the adaptation of fish.*
  - *I think about the programs a lot. When I saw those deep water jellyfish, I thought, "Turn off the radio telescopes and lets build more aquatic space probes."*

- Another one-fifth (20%) said they experienced a greater appreciation for animal life and/or biodiversity. A few viewers added that as a result of viewing *The Shape of Life* they felt more inspired to do something about preserving animal life and/or biodiversity. For example:
  - *Thought about the value of diversity and that I want to do something about protecting it.*
  - *Reacquainting me with my childhood, appreciation and awe of sea life.*
  - *I am even more motivated than ever to want to do something to preserve the animals and to appreciate the ones who share this planet with us.*
  - *The interconnectedness and interdependence of all life on earth. All life it seems is just one form of life. I think that all thinking people in the whole world should see this and respect the entire web of life on Earth.*

- Fifteen percent (15%) said they reflected on the origins and evolution of life, as in:
  - *Pondered more about evolution and the creation of life.*
  - *Thought about how I was more enlightened regarding our origins and how we evolved.*

- Fifteen percent (15%) said they gave some thought to pursuing marine biology as a career:
  - *It helped in my exploration of careers in marine biology.*
  - *Made me want to go back to school and become a marine biologist.*

- Ten percent (10%) said they spent some time developing plans for using the series in their teaching, as in: *I have always taught a great deal about invertebrates, because the students are less familiar with them. I am interested in using the videos to augment our discussions and projects. We already participate in Rescue the Reef Earth Foundation Project*.

- Several individual viewers described other kinds of influences, as listed below:
  - *My brain went off on all these theories about emotional evolution and creative expansion. It helped me realize how important it is to be fascinated and how only fascinated people can be creative/curious/productive, intelligent . . . I want to help people be fascinated.*
  - *Has inspired me to think of different ways to photograph and videotape.*
  - *Have thought more about life in cold climates.*
  - *How to find the right level for a public presentation to a broad audience.*

- *Inspired me to create some new masks and headpieces.*
- *That I want to see the rest of the series and may need to buy it.*
- *Thought more that it was interesting, I enjoyed it.*

Media experiences that reminded viewers of *The Shape of Life*

Viewers were asked whether they had read anything, seen anything on television, or heard anything on the radio that made them think of *The Shape of Life.* While forty-one percent (41%) reported they didn't have a media experience that reminded them of the series, more than half (55%) reported they had. Table 20 summarizes the media sources these viewers pointed to.

Table 20
Media experiences that reminded viewers of *The Shape of Life*

Media:	Total (n=27)
Television: Nature programs, NOVA	45%
Print media: science articles, book on biodiversity, scuba magazines	33%
Radio: NPR	18%
Media type not specified	4%

All but four of the viewers who experienced a media connection with *The Shape of Life* (n=27) identified at least one media source where the connection occurred, although none elaborated on the nature or scope of the connection. The evaluation found:

- Half the viewers who experienced a media connection (50%) said they had watched another television program that reminded them of *The Shape of Life*. Most of these viewers pointed to other nature/science programs.
  - *Some Nova programs.*
  - *Pretty much anything on TV that has a picture of an animal or talks about biology or evolution.*
  - *Watching nature programs reminds me of the series*
  - *I compare other "nature" programming to the standard of The Shape of Life.*

- About one-third (35%) said they had read something in a print media (science article, book on biodiversity, or scuba magazine) that had reminded them of the series. For example:
  - *Articles on science and science news made me think about Shape of Life.*
  - *I read a book by Collin Judge titled The Diversity of Life which is a great complement to The Shape of Life.*

- *Scuba magazines.*

- One-fifth (20%) percent said they had listened to radio programming on NPR about animal extinction or sea animals that reminded them of *The Shape of Life*.
  - *There was a program about animals going extinct on NPR.*
  - *Bailey White mentioning oysters on National Public Radio yesterday.*

Viewer interactions with local aquaria

Viewers and non-viewers were asked a series of questions about their interactions with their local aquaria, including:

i. When they lasted visit their local aquaria and whether they participated in any activities that involved *The Shape of Life,* and what they most liked and disliked about the activities.

ii. Whether they purchased anything from the aquaria gift shop during their visit(s) and whether the purchase had anything to do with *The Shape of Life*, and

iii. How likely they were to visit their local aquaria within the subsequent one-two months and the extent to which seeing the series influenced their plans to visit.

Viewer and non-viewers responses to each question are summarized below.

When viewers and non-viewers last visited their local aquaria

Viewers and non-viewers were asked when they last visited their local aquaria. Table 21, to the right, summarizes the month or year viewers last visited. Note that viewers as a whole had visited their aquarium somewhat more recently than non-viewers.

Table 21
When viewers and non-viewers last visited their local aquaria

When visited	Viewer (n= 34)	Non-viewer (n=180)
April 2002	38%	12%
March 2002	6%	9%
January/February	15%	9%
Last year (2001)	38%	55%
Never	3%	13%

Viewers: Among the viewers to answer this question (n= 34), about two-fifths (38%) said they visited their aquaria the month *The Shape of Life* premiered on PBS (April 2002), while about one-fifth had (21%) had visited 1-3 months prior to the premier. The remaining viewers had last visited sometime in 2001 (38%) or had never visited (3%).

Non-viewers: Among the non-viewers to answer the question (n=180), 12% said they visited their aquaria the month of the series premier, while about one-fifth (18%) had visited 1-3 months prior to the premier. The remaining viewers had last visited sometime in 2001 (55%) or had never visited (13%).

Participation in activities that involved *The Shape of Life*

Viewers and non-viewers who visited their local aquaria the month before or during *The Shape of Life* broadcast (March-April, 2002) were asked whether they participated in any activities that involved *The Shape of Life.*

Among the fifteen viewers (n=15) who had visited their local aquaria during this timeframe, less than half (n=6), reported they had participated in activities involving *The Shape of Life*. These viewers were then asked to specify the activities and what they most liked and disliked about them. Among these six viewers, four stated that they had attended lecture events at their aquaria, with one stating that she particularly liked having *Exposure to the professionals in their fields.* One viewer said he saw videos at his local aquaria that involved *The Shape of Life* and one said he participated in an activity that was represented in the series as*: I fed the jellyfish.*

Among the non-viewers to visit their local aquaria the month before or during *The Shape of Life* broadcast (n=39), none reported participating in activities involving the series.

Purchase of items from aquaria gift shops during visit

Those who visited their aquaria during the March-April 2002 timeframe were asked whether they bought anything from the aquaria gift shop during their visit(s).

Among the 15 viewers to visit their aquaria during this timeframe, most (n= 12) said they had purchased something from the gift shop. These twelve (n=12) viewers were then asked to specify what they bought and whether their purchase had anything to do with *The Shape of Life*. Four of these viewers (n=4) said their purchase had something to do with the series. Their purchases included:

- *Sea animal plastic toys for grandchildren.*
- *Book on marine life.*
- *Book on marine invertebrates.*
- *We had a 9 year old with us and bought a souvenir of the jellyfish.*

Among the 39 non-viewers to visit their aquaria during the same timeframe, half (n=20) said they purchased something from the gift shop, although their purchase didn't have anything to do with the series.

Likelihood of visiting local aquaria within subsequent one-two months

Viewers and non-viewers were asked to estimate how likely they were to visit their local aquarium within the subsequent one-two months, using a scale of 1 (Not at all likely) to 5 (Very likely). Viewers were somewhat divided on this issue, as evidenced by the mean rating for the item (3.4). More than half (55%) said they were moderately or very likely to attend , twelve percent (12%) were somewhat likely to attend, and one-third (33%) were moderately or very unlikely to attend.

Non-viewers were also somewhat divided on the issue. The mean rating for non-viewers was 3.1, which was lower, but not significantly different from viewers mean rating of 3.4. Two-fifths of

non-viewers (40%) said they were moderately likely to attend, 21% were somewhat likely to attend, and two-fifths were moderately or very unlikely to attend

Influence of viewing series on intention to visit

Viewers who indicated they were moderately or very likely to visit their local aquarium were asked to what extent seeing the series influenced their decision to visit on a scale of 1 (hasn't influenced at all) to 5 (influenced very much). Table 22 presents the findings for the viewers who expected to attend their aquaria in the given timeframe.

Among these twenty-nine viewers (n=29), all but one viewer said the series was at least a little influential in their decision to attend. In terms of the degree of the influence:

- More than one-third (38%) said the series very much influenced their decision to attend.
- More than one-fifth (21%) said that the series moderately or somewhat influence their decision.
- More than one-third (38%) said the series influenced their decision to attend a little.
- Three percent (3%) said watching the series had no influence on their decision to attend.

Table 22
Perceived influence of series on visiting local aquaria

	Total (n= 29)
Very much	38%
Moderately	6%
Somewhat	15%
A little	38%
Not at all	3%

Viewer visits to websites featuring information about *The Shape of Life.*

Viewers were asked whether they had visited any websites that featured information about *The Shape of Life* series. The majority of viewers (69%) said they had not visited any websites featuring information about the series. Nearly one-third, however (31%) said that they had visited such a website. All of these viewers (n=15) reported having visited the PBS.org website, with one viewer elaborating: *The photography and information are very well set out. It is book marked on my computer.* Many of these visitors (n=10) had also visited the Sea Studios Foundation website. One viewer reported visiting the Cabrillo Aquarium website, at cabrillioaq.org.

Viewers' self-reported learning/gains from websites visited

Website visitors were also asked to briefly describe what they learned or gained from the website(s). Several viewers briefly described something they found of value, as follows:

- *I learned that I would need a nice chunk of time in order to be able to investigate the beautiful site more fully.*
- *Cool pictures.*
- *I was looking for information about the backgrounds of the show's producers. It was all there. Great!*
- *I was able to purchase the Series from http://www.shop.pbs.org*
- *That there's 1 more show on this Sunday!*
- *Source of future research and educational projects for my classes.*

Conclusions

Evaluators collaborated with five aquaria from *The Shape of Life* Consortium to solicit the reactions of a random sample of their members to the series as it aired over the course of three consecutive Tuesdays from 9-11 pm on PBS April 2nd – April 16th, 2002. The aquaria were located in geographically disperse regions, with two on the West Coast (Seattle Aquarium in the Northwest and Cabrillo Marine Aquarium in the Southwest), one in the Midwest (Shedd Aquarium), and two on the East Coast (Dauphin Island Sea Lab in the Southeast and New York Aquarium in the Northeast).[15]

The evaluation design involved mailing a questionnaire to a random sample of 550 members drawn from the aquaria membership lists. The evaluators timed the mailings so that the questionnaires arrived immediately following the final night of programming (April 16th). A $1 incentive and return envelope were also included with each mailing. The questionnaire invited all recipients to complete the surveys so comparisons could be made between viewers and non-viewers of the series.

Respondent demographic and background information

A total of 49 viewers and 210 non-viewers completed questionnaires that subsequently formed the basis for this evaluation report. The viewer portion of the respondent sample included:

- Considerably more west coast than east coast or midwest respondents (80% vs. 20% vs. 10%).
- More females (55%) than males (45%).
- A wide range of ages, spanning 18-81 years, with a mean age of 52 years. The majority of respondents were between the ages of 30-69.
- A racial distribution that was predominately White (82%), with a small percentage of Asian (9%) and Hispanic/Latino (8%) viewers.
- A range of occupational situations. Half (51%) were employed and one-third (33%) were retired, while the remaining participants were students (6%), unemployed (6%), or homemakers (4%). Of the employed, about three-quarters (72%) felt they needed an understanding of science in their line of work, while a little over one-quarter (28%) did not.
- Many regular viewers of science nature/television programs, with two-thirds of the viewers (64%) reporting they watched science/nature programs everyday or once a week or more. The remaining viewers reported watching 2-3 times a month (22%) or about once a month (14%).

Chi-square analyses revealed the viewing and non-viewing respondents did not differ significantly with respect to age, gender, geographical region, or frequency of viewing science/nature shows, but the groups did differ significantly with respect to occupational status, as viewers of *The Shape of Life* were more frequently retired.

---

[15] Information about the five aquaria partners can be found at the following websites: Cabrillo Marine Aquarium http://www.cabrilloaq.org/; Seattle Aquarium: http://www.seattleaquarium.org/; Shedd Aquarium: http://www.shedd.org/; Dauphin Island Sea Lab: http://www.disl.org/; New York Aquarium: http://wcs.org/home/zoos/nyaquarium/.

Viewer exposure to *The Shape of Life* episodes

Over two-thirds of the viewers who responded to the survey watched most or all of the six episodes broadcast during the April 2002 PBS premiere. Specifically: about four-fifths watched the first two episodes that aired on April 2nd (*Origins* and *Life on the Move*); about two-thirds watched the middle two episodes that aired on April 9th (*The First Hunter* and *The Conquerors*); and about four-fifths watched the final two episodes that aired on April 16th (*Survival Game* and *Ultimate Animal*).

How viewers learned about *The Shape of Life*

Viewers of *The Shape of Life* learned about the series through a variety of sources, as follows:

- Nearly half of the viewers found out about the series through their local aquaria.
- Nearly one-fifth saw a television commercial or promotion about it.
- One-tenth noticed the bookmark about the series sent by the project evaluator.
- One-tenth found out about the series while channel surfing.
- Smaller percentages of viewers said they learned about the series from local newspapers, friends or family members, PBS station publications, or a PBS website.

Role of the local aquaria in informing viewers and non-viewers about *The Shape of Life*

The evaluation found that over half of the viewers and four-fifths of the non-viewers did not learn about *The Shape of Life* from their local aquarium. Among those who did learn about the series from their aquarium:

- Nearly one-fifth of viewers and one-tenth of non-viewers said they received an aquarium newsletter that contained information about the series.
- Over one-tenth of viewers and a handful of non-viewers learned about the series from a bookmark provided to them at their aquarium.
- Smaller percentages of viewers and non-viewers heard about the series while attending an aquarium lecture event or through an aquarium website, email announcement, poster, or handout.

Viewer reasons for watching *The Shape of Life*

Viewers who described their reasons for watching the series (n=41)[16] specified a range of factors that attracted them, as follows:

- Nearly half of the viewers were interested in the subject matter addressed in the series. These viewers either described their subject matter interest in general terms, as in *Subject matter interests me*, or stated a specific interest in the subjects of marine life or evolution.
- About one-quarter encountered television promotions about the series. At least half of these viewers said they were attracted to the photography shown in the promos, which they described as *incredible, beautiful,* or *compelling*.
- Nearly one-fifth watched because they were channel surfing and *The Shape of Life* caught their eye.
- Nearly one-fifth watched because a lecture event they attended at their aquaria or PBS station got them excited about the series. All of these viewers resided in California and were referring to lecture events held by KCET and/or Cabrillo Marine Aquarium.
- One-tenth watched because they are routinely drawn to nature documentaries.

[16] Respondent size (n) is specified in the report where not all viewers or non-viewers answered the question.

- Nearly one-tenth watched because a friend or family member recommended the series.

Non-viewer reasons for not watching *The Shape of Life*

About two-thirds of the non-viewers said they didn't watch *The Shape of Life* because they didn't know about it. Other reasons were each offered by one-fifth or less of the non-viewers, as follows:

- One-fifth of the non-viewers were unable to watch at the time it aired (9-11 pm).
- Nearly one-tenth didn't own a television or rarely watch TV.
- Smaller percentages of non-viewers indicated: the subject matter didn't interest them; they don't watch PBS or can't get the channel on their TV; or they forgot about it but read about it in newsletter or bookmark sent by the evaluator.

Viewer and non-viewer preferences for how the episodes are broadcast

Nearly half the viewers and two-fifths of the non-viewers said they would have preferred to see the episodes broadcast one at a time. A somewhat smaller percentage of respondents in each group stated a preference for seeing the episodes broadcast back-to-back, however, just as they aired in April 2002. Meanwhile about one-tenth of viewers and one-quarter of non-viewers indicated no preference either way.

Viewer overall ratings for *The Shape of Life*

Viewers were asked to rate various programming elements from the series on a scale of 1 to 5.[17] Viewers reacted very positively in each case and generally felt:

- They liked the series (mean 4.7).
- The content was interesting (mean, 4.7).
- The series was visually exciting (mean, 4.8).
- The storytelling approach was interesting (mean, 4.6).
- The presentation was generally clear (mean 4.6).
- They learned a lot (mean, 4.5).
- The amount of information presented was about right (mean, 3.3); and
- The amount of explanation of scientific principles was about right (mean, 3.3).

What viewers most liked about *The Shape of Life*

Viewers were asked to describe what they liked most about *The Shape of Life*. Viewers were very positive about the series and appreciated a variety of programming elements, as follows:

- More than half praised the cinematography and used adjectives like *beautiful, incredible, stunning*, or *colorful* to describe it.
- More than one-third particularly liked the storytelling approach, and typically praised the approach as *easy to understand, smooth flowing, creative,* or *story-like*.
- Nearly one-third liked learning about the diversity and/or origins of animal life on Earth.
- About one-fifth praised the animation/graphics used in the series and described them as *excellent* or *useful for explaining concepts presented*.
- Less than one-tenth liked the scientists featured in the series. Viewers mentioning this theme liked that *the scientists were different in each segment* or were *fun characters* to watch.

[17] The full report defines the 1-5 scale for each item, but generally speaking, the higher the number the more positive the rating.

- Smaller percentages of viewers liked, in descending order of frequency: the opportunity to see animal life forms they wouldn't otherwise have an opportunity to see; that the science information presented was new and fresh, the narration; or the music.

What viewers disliked about *The Shape of Life*

Viewers were asked to describe what, if anything, they disliked about the series. About two-thirds felt there wasn't anything they disliked, with many instead adding general praise for *The Shape of Life*. Much smaller percentages of viewers mentioned specific dislikes as follows:

- About one-seventh took issue with the timeslot the program aired; about half of these viewers complained that the broadcast time (9-11 pm) was *too late* and half complained about the program being aired in a *back-to-back fashion*.
- Nearly one-tenth felt that the programming was at times *repetitive*.
- Smaller percentages of viewers felt that the programming: was *too verbal* or had *too much monologue* or *lacked sufficient science background information*.
- Other dislikes mentioned by individual viewers included: that there was too much focus on the scientists as individuals; that the narration was overpowered by the soundtrack; or that the series at times featured too little or too much footage of specific kinds of animals.

Viewer and non-viewer interest & knowledge in the rise of the animal kingdom

When asked to rate their interest in learning about the rise of the animal kingdom, viewers expressed a significantly higher level of interest in this subject matter than did non-viewers. Similarly, when asked to rate their knowledge of the rise of the animal kingdom, viewers felt significantly more knowledgeable about this topic than did non-viewers. Whether the viewers' higher levels of interest and self-assessed knowledge can be attributed to their viewing the series, however, cannot be determined with the current evaluation design.

What viewers felt they learned from *The Shape of Life*

Viewers were asked to describe what they learned from *The Shape of Life* that most interested them. All the viewers who answered this question (n=34) pointed to at least one fact, concept, or principle they learned from the series. The kind of learning they discussed fell into two main categories, as follows:

- More than half of the viewers were interested in facts learned about animal behavior. Citing specific animals featured in the series (e.g., sponge, nautilus, seastar, octopus, flatworm, and squid), these viewers were most frequently interested in the feeding, mating, mobility, and defensive behaviors covered.
- Two-fifths, meanwhile, were particularly interested in information they learned about the origins and evolution of animal life on Earth.
- A few individual viewers pointed to other things they learned of interest, including: *The Stories behind science; The community concern about the Scottish flatworm problem; How much we do not know about our oceans;* and *All living things play a vital role in keeping Earth alive, even the lowly worms.*

Knowledge relating to core science information and concepts presented in the series

Knowledge of methods used to study the rise of the animal kingdom

Viewers and non-viewers were asked to list the kinds of methods scientists use to study the rise of the animal kingdom and to list as many methods as they could. In response, every viewer listed at least one method and most generated 2 or more (mean 2.2). Meanwhile, about four-fifths of non-viewers listed at least one method and most only generated only 1 (mean 1.0).

Viewer and non-viewer responses generally fell into about seven different categories. Across each category, viewers listed 2-3 times more methods than non-viewers, as follows:

- Fossil excavation and analysis: More than two-thirds of viewers mentioned fossil excavation/analysis, compared to one-third of non-viewers.
- Genetic testing/DNA analysis: Nearly two-thirds of viewers mentioned genetic testing or DNA analysis, compared to one-quarter of non-viewers.
- Field research – observe animals that live today for clues to the past: Nearly two-fifths of viewers mentioned field research (particularly involving the observation of animals that live today for clues to the past), compared to one-tenth of non-viewers.
- Conduct lab-based experiments: Nearly two-fifths of viewers said that scientists could conduct lab-based experiments to study animal evolution, compared to one-tenth of non-viewers.
- Compare and classify animals by characteristics: Nearly one-third of viewers said that a method for studying early animal life involved categorizing or classifying animals, compared to a handful of non-viewers.
- Use of computer technologies: One-quarter of the viewers mentioned using computer technologies in the study of early animal life on Earth, compared to a handful of non-viewers.
- Underwater photographic techniques: One-quarter of the viewers mentioned the use of underwater photographic techniques, compared to a couple of non-viewers.

Knowledge of animal body plans

Viewers and non-viewers were informed that scientists can classify animals according to a limited number of body plans or "blueprints" and then asked to think of an animal and list the features the animal has in common with other animals of the same body plan. In response, two-fifths of the viewers and one-tenth of the non-viewers identified an animal and then correctly described at least one body plan feature the animal shared with other animals of the same plan. The specific findings for each group of respondents follows:

Viewer findings: Two-fifths of the viewers identified an animal and then correctly described at least one body plan attribute it shared with other animals of the same plan. When choosing an animal, most viewers selected invertebrates, which were a primary focus of the series. Note however that none of the viewers used phylum terminology in their answers, but rather listed

their animal of choice, followed by the characteristics they perceived it shared with other animals. For example:

- About two-thirds of the viewers specifically focused on the seastar or other echinoderms such as the sea cucumber or sea urchin. These viewers mentioned a range of body plan features the animal shared with other echinoderms, including: an internal skeleton, a five-part symmetry, and a special fluid-filled system that operates the tube feet.
- About one-quarter focused on the lobster as their animal of choice. These viewers also mentioned a range of body plan features the animal shared with other arthropods, including: a hard exoskeleton, the possession of jointed appendages, and a segmented body.
- About one-fifth focused on the worm. These viewers also mentioned a range of body plan features the animal shared with other arthropods, including: a description of bilateral symmetry, a centralized nervous system, a head and tail, and no body cavity or hard skeleton shared with other flatworms.

Non-viewer findings: Compared to four-fifths of viewers, only one-tenth of non-viewers were able to identify an animal and then correctly describe at least one body plan feature it shared with other animals of the same plan. Most non-viewers did not focus on body plan attributes perse, but rather characteristics particular to the animal they listed, with the majority focusing on exterior physical (e.g., fur, skin) and/or behavioral (e.g., intelligence, mobility, feeding) characteristics. Most non-viewers listed mammals as their animal of choice, while very few listed invertebrates.

How viewers compared *The Shape of Life* to other nature/science series

Viewers were asked to compare *The Shape of Life* to other nature/science series they'd seen. Just about all the viewers who answered the question (n=33) said they felt *The Shape of Life* compared *very favorably* or was *much better*. The evaluation further found:

- About half of the viewers felt *The Shape of Life* featured superior cinematography and used adjectives like *fabulous, wonderful,* and *superior quality* to describe the difference.
- About one-third felt *The Shape of Life* was *more informative* or *educational*.
- About one-quarter felt *The Shape of Life* did a better job of presenting the information it covered. These viewers typically explained that they felt the series was: *easier to understand or relate to, better organized* or *more engaging.*
- Just over one-tenth preferred the animation and computer graphics, noting that series offered *superb animation* or *greater use of computer animation*.
- Nearly one-tenth preferred the scientists featured in *The Shape of Life* and felt they were *easier to relate to and understand.*
- Nearly one-tenth felt *The Shape of Life* stood out given the amount of attention it gave to marine life.
- Individual viewers mentioned additional ways they preferred *The Shape of Life*, including: *Committed to evolution viewpoint; Not as cheesy lines;* and *Great Science.*

Finally, a couple of viewers were generally neutral about the issue, stating that they felt *The Shape of Life* was more or less comparable to other nature/science shows they watched.

How viewers compared *The Shape of Life* scientists to those in other nature/science series

The majority of viewers felt the scientists featured in *The Shape of Life* were preferable to those in other nature/science programming, as follows:

- About one-quarter felt *The Shape of Life* scientists were more *enthusiastic or passionate*.
- About one-quarter felt they were more *personal, down-to-earth*, or *less arrogant*.
- About one-seventh felt they were more *diverse*, and in particular, included more women, disabled, and minority scientists.
- About one-seventh felt they were *better-spoken* or *easier to understand.*
- One-tenth felt that they were *more knowledgeable* or *advanced in their fields*.
- Individual viewers mentioned additional ways they preferred *The Shape of Life* scientists, including: *The scientists featured were truly field scientists which was refreshing; Its tough to watch a bookworm explain ideals and facts; I found it interesting that not all the scientists featured stories that had "happy endings" but at least the outlook was always helpful; Scientific honesty;* and *More sciencey, very interesting*.

Meanwhile, one-tenth of viewers felt *The Shape of Life* scientists were comparable to scientists in other nature/science shows and one-tenth felt they were less preferable, with viewers in both groups offering varying reasons for their position.

Viewer assessment of the success in achieving informal science education goals

Viewers strongly felt *The Shape of Life* was very successful in accomplishing a variety of informal science education goals asked about in the evaluation. The evaluation found:

- All the viewers felt *The Shape of Life* successfully showed the special features or adaptations different animals have that help them survive in their habitats.
- All but a few felt *The Shape of Life* successfully: showed that animals can be grouped according to body plans; used animation to show the internal structure and workings of the first animals that lived on Earth; presented credible scientific evidence; gave them a greater appreciation for the diversity of animal life forms on Earth; and showed how animals that first lived on Earth compare to animals living today.
- About four-fifths felt *The Shape of Life* successfully: showed scientists driven by passion and curiosity; explained the techniques scientists use to study the origins of animal life; and expanded their view of what constitutes an "animal;" and
- Three-quarters felt the series increased their curiosity about animal body plans.

Viewer discussions with others about *The Shape of Life*

Viewers were asked whether they had discussed *The Shape of Life* series with anyone since the series began on April 2nd. About three-quarters confirmed they talked to others about the series while about one-quarter had not.

Viewers who had discussed the series with another said they discussed it with at least one other person, most typically a friend, family member, or co-worker. All but one viewer discussed the series in positive terms. Most notably:

- Nearly half of the viewers talked about specific animal behaviors featured in the series. Most frequently, these viewers talked about *interesting* or *fascinating* behaviors depicted in the show involving sponges, flatworms, and echinoderms (echinoderms were mentioned as a

group, no specific echinoderms were named). Among the behaviors discussed, viewers most frequently discussed the predatory behavior of flatworms and sponge pumping or mobility.
- About one-third talked about the evolutionary content of the series, most frequently the evolution evidence concerning how animal life evolved over time, and the diversity of animal life that has resulted.
- One-fifth discussed the series cinematography as *excellent, amazing, high-quality* or *beautiful.*
- About one-eighth discussed the series overall presentation or storytelling approach as *stimulating, exciting, interesting,* or *engaging*.
- About one-eighth discussed the overall appeal of the series, and specifically encouraged friends, co-workers, or family members to watch the series.
- One-tenth discussed the animation or time-lapse photography as *high quality* or *excellent*.

Viewer recommendations about *the Shape of Life* to others

Viewers were asked whether they had recommended *The Shape of Life* series to anyone. About three-quarters confirmed they had recommended the series to a friend, family, or co-worker while about one-quarter had not. Viewers who recommended the series did so as follows:
- Two-fifths recommended the overall presentation as *beautiful, exciting* or *well done.*
- About one-third recommended the series as a *good* or *interesting* animal/nature show.
- About one-eighth each recommended: the *spectacular* or *excellent* cinematography; the *breathtaking* or *wonderful* animation*;* the information about invertebrates; or the information about evolution.
- Other elements recommended by individual viewers focused on: the narration; *The Shape of Life* website; or the fact that the featured scientists speak English.

Influence of *The Shape of Life* on viewer thoughts and actions

Viewers were asked whether seeing *The Shape of Life* affected anything they thought about or did since seeing the series. More than half said the series had affected them in some way, while just under half said it had not. Those who reported the series influenced their subsequent thoughts and actions elaborated as follows:
- One-fifth thought about specific animals or animal body plans featured in the series.
- One-fifth experienced a greater appreciation for animal life and/or biodiversity. Some added that they felt more inspired to do something about preserving animal life and/or biodiversity.
- About one-eighth reflected further on the origins and evolution of life.
- About one-eighth gave some thought to pursuing marine biology as a career.
- One-tenth said they spent some time developing plans for using the series in their teaching.
- Several individual viewers described other kinds of influences, such as: *How to find the right level for a public presentation to a broad audience; Inspired me to create some new masks and headpieces;* and *That I want to see the rest of the series and may need to buy it.*

Media experiences that reminded viewers of *The Shape of Life*

Viewers were asked whether they had read anything, seen anything on television, or heard anything on the radio that made them think of *The Shape of Life.* More than half reported they had such an experience. The evaluation further found:
- Half of the viewers who experienced a media connection said they had watched another television program that reminded them of *The Shape of Life*.

- About one-third had read something in a print media (science article, book on biodiversity, or scuba magazine) that had reminded them of the series.
- One-fifth had listened to radio programming on NPR about animal extinction or sea animals that reminded them of the series.

When viewers and non-viewers last visited their local aquaria

Viewers and non-viewers were asked to identify when they last visited their local aquarium. The evaluation found the following:

Viewers: Among the viewers to answer this question (n= 34), about three-fifths said they visited their aquarium the month *The Shape of Life* premiered on PBS (April 2002) or 1-3 months before the premiere. The remaining viewers had last visited sometime in 2001 or never visited.

Non-viewers: Among the non-viewers to answer the question (n=180), nearly one-third said they visited their aquaria the month of the series premier or 1-3 months before. Nearly two-thirds last visited sometime in 2001 or never visited.

Participation in aquaria activities that involved *The Shape of Life*

Among the viewers who visited their local aquarium during March-April 2002, less than half reported they had participated in activities involving *The Shape of Life*. Among this handful or so of viewers, most had attended lecture events, with one particularly liking the *Exposure to the professionals in their fields.* One viewer saw videos at his local aquaria that involved *The Shape of Life* and one said he participated in an activity that was represented in the series as*: I fed the jellyfish.*

Among the non-viewers to visit their local aquaria the month before or during *The Shape of Life* broadcast, none reported participating in activities involving the series.

Purchase of items from aquaria gift shops during visit

Viewers and non-viewers who visited an aquarium during March-April 2002 were asked whether they bought anything from the aquaria gift shop during their visit. Most of the viewers confirmed they had made a gift shop purchase, and about half said their purchase had something to do with the series. Purchases relating to *The Shape of Life* included: *Sea animal plastic toys for grandchildren, Book on marine life, Book on marine invertebrates,* and *We had a 9 year old with us and bought a souvenir of the jellyfish.* Among the non-viewers to visit their aquaria during the same timeframe, half said they purchased something from the gift shop, although none of their purchases related to the series.

Likelihood of visiting local aquarium within subsequent one-two months

Viewers and non-viewers were asked to estimate how likely they were to visit their local aquarium within the subsequent one-two months, using a scale of 1 (Not at all likely) to 5 (Very likely). Based on the viewer mean rating for the question (3.4), viewers were somewhat divided on this issue. Over half said they were moderately or very likely to attend, while more than one-tenth was somewhat likely to attend, and one-third was moderately or very unlikely to attend.

Non-viewers were also somewhat divided on the issue. The mean rating for non-viewers was 3.1, which was lower, but not significantly different from viewers' mean rating of 3.4. Two-fifths of non-viewers said they were moderately likely to attend, one-fifth were somewhat likely to attend, and two-fifths were moderately or very unlikely to attend.

Influence of viewing *The Shape of Life* on intention to visit

Viewers who said they were moderately or very likely to visit their local aquarium within the subsequent one-two months (n=29) were asked to what extent seeing the series influenced their decision to visit. All but one of these viewers said the series played a role in their decision to attend, and nearly two-thirds said the series influenced their decision somewhat or very much.

Viewer visits to websites featuring information about *The Shape of Life.*

Nearly one-third of the viewers said they had visited a website featuring information about *The Shape of Life.* All of these viewers reported having visited the PBS.org and many had also visited the Sea Studios Foundation website. One viewer reported visiting the Cabrillo Aquarium website.

Website visitors were also asked to briefly describe what they learned or gained from the websites. Several viewers briefly described something they found of value, as follows: *I learned that I would need a nice chunk of time in order to be able to investigate the beautiful site more fully; Cool pictures; I was looking for information about the backgrounds of the show's producers. It was all there--Great!; I was able to purchase the Series from http://www.shop.pbs.org; That there's 1 more show on this Sunday!;* and *Source of future research and educational projects for my classes.*