Pre- and Post-Program Questionnaire

The pre- and post- show questionnaire is intended to serve as a measure of effectiveness of both the show itself and the supplemental material. Prior to any information about the show being provided to students they should take the pre-show questionnaire. This should serve as an accurate gauge of their prior knowledge.

Upon completion of viewing the show and the activities on the following pages, students should be given the same questionnaire. By comparing the pre-show and post-show scores, the overall effectiveness of the program can be determined. If these are used, we would appreciate giving the results to Dr. Reiff (reff@rice.edu).

Name _____

We Choose Space! **Questionnaire**

1) Which U.S. President announced, at Rice University that we would travel to the moon?

a) John F. Kennedy
b) Lyndon B. Johnson
c) Dwight D. Eisenhower
d) Richard M. Nixon

2) Which country was the first to put a human into space?

a) The United States
b) Italy
c) The Soviet Union
d) Japan

3) A young Earth was formed from which of the following?

a) accretion
b) condensation
c) planetesimals
d) all of the above

4) Which of the following theories is the accepted idea of how our moon formed?

a) fission
b) impact
c) capture
d) co-formation

5) Which celestial object is responsible for Earth's tides?

a) Sun
b) comets
c) Moon
d) asteroids

6) What is the duration of time an astronaut can stay on the International Space Station?

a) 6 months
b) 6 weeks
c) 1 year
d) 6 years

7) What is the main source of power for the International Space Station?

a) nuclear power
b) solar power
c) rocket fuel
d) oxygen

8) The areas that contain trapped ice on the Moon are:

a) the poles
b) the near side
c) the far side
d) the craters

9) Sixty five million years ago Earth had an impact with what type of object that destroyed over half of all species?

a) comet
b) meteor
c) planet
d) asteroid

10) What energy fuel on the moon could power tomorrow's nuclear fusion reactors on Earth?

a) hydrogen
b) solar
c) helium 3
d) oxygen

11) The flying human in the lunar habitat is most like
- a) an eagle
- b) a bat
- c) a flying squirrel
- d) a moth

12) Creating a human-rated habitat on the moon will likely be
- a) expensive
- b) difficult to construct
- c) not in the near future
- d) all of the above

13) If someone is born on and grows up on the Moon, what might happen if they visit Earth?
- a) they will be stronger and have weaker bones than folks who grew up on Earth
- b) they will be weaker and have weaker bones than folks who grew up on Earth
- c) they will be stronger and have stronger bones than folks who grew up on Earth
- d) they will be weaker and have stronger bones than folks who grew up on Earth

14) One of the most important things that we have learned from the space program is
- a) that Earth is the planet best suited for us to live in so we should take care of it
- b) that the Moon would be easy to colonize
- c) that a space station can be created quickly and inexpensively
- d) that we should use up all our oil on energy and not develop solar energy

15) How does the gravity on the Moon compare to the gravity on Earth?
- a) less gravity on the Moon
- b) more gravity on the Moon
- c) the same amount of gravity
- d) there is no gravity on the Moon

16) How often is there a sunrise on the space station?
- a) every 24 hours
- b) every 90 hours
- c) every 24 minutes
- d) every 90 minutes

We Choose Space!
Questionnaire Answer Key

1) a – John F. Kennedy

2) c – The Soviet Union

3) d – all of the above

4) b – impact

5) c – Moon

6) a – 6 months

7) b – solar power

8) a – the poles

9) d – asteroid

10) c – helium 3

11) c – a flying squirrel

12) d – all of the above

13) b – they will be weaker and have weaker bones than folks who grew up on Earth

14) a – that earth is the planet best suited for us to live in so we should take care of it

15) a – less gravity on the moon

16) d – every 90 minutes

Discussion Questions

(the show may be stopped at break points for group discussion
or you can discuss these after the show.)

Technology:

1. How has the technology of space travel changed in the past forty years? Is it more or less comfortable to go into space? More or less dangerous?
2. How many years did it take to build the space station? How long do you think it would take to build it on earth? What challenges must be faced by construction crews in space?
3. Do you think the lunar biosphere is realistic? What kind of less expensive habitat might you imagine for a first building on the Moon?

Habitats and Environments:

1. What things do people absolutely need to have in their environment to survive on the moon?
2. What things are very important, but not essential?
3. How do you decide what is worth the weight of taking up into space?

Gravity:

1. Why is the moon's surface gravity so much less than Earth's? If the moon were more dense (same mass but smaller radius), would its gravity be bigger or smaller?
2. When you become fully adapted to life on the Moon, will you still be able to jump as high as you did when you first arrived?
3. What other effects will low gravity have on plants and animals?

Space Exploration:

1. What should be the next destination for humans to travel to? Why?
2. Why are robotic missions so much more cost-effective than human exploration?
3. In what circumstances are humans better explorers than robots?

Science and Society:

1. What kinds of jobs would be needed in a space colony?
2. What kinds of jobs would NOT be needed in a lunar colony?
3. Would children born on the Moon be able to visit Earth?

Discussion questions during the show:

1: When we went to the moon, income taxes were higher. Would you pay higher income taxes to return to the Moon or travel to Mars?

2: What space events occurred the year you were born?

3: Would you like to go to space as a tourist? How much would you pay for a week in space?

4: Some argue that without the Moon we would not have metals near the surface and so no life. What would the Earth be like without a Moon? Would the day be longer or shorter? (A: shorter. The tides have caused the Earth's spin to slow down)

5. Why are the wheels on the lunar rover made of mesh? Is the lunar surface rocky, marshy or dusty? (A: dusty over rocks. The mesh allows the dust to fly off and not cling to the wheels. Gives good traction with little weight)

6. Some people argue that the lunar landings were faked. Can you see evidence in these movies that the gravity they are experiencing on the Moon is less than on Earth? (A: The dust they kick up falls slowly; when they trip they fall slowly)

7. What kinds of supplies do astronauts on the ISS need to live? How much of their food, air and water is recycled?

8. What kinds of scientific experiments are best done in space? (A: experiments that need a free-fall (weightless) environment)

9. What kinds of things can commercial space transport companies do that NASA cannot? (A: NASA cannot take tourists, for example, but commercial space operators can.)

10. What would be the advantage to take off from the space station instead of the Earth's surface when traveling to the Moon or Mars? (A: You can bring up your fuel separately and not have to make such a huge rocket to take off from Earth. You need less energy to leave the ISS orbit than to leave the surface of Earth.)

11. What would be the advantage to use the lunar surface as a base for radio telescopes (and X-ray and gamma-ray telescopes?) A: No atmosphere or ionosphere to absorb the signals from space.

12: Why is having a base at the south pole good for energy? (A: If you have a base exactly at the south pole, the sun will just travel around your horizon every day. No

night means you won't have to store solar energy in batteries. Most places on the Moon have 14 days of sunlight then 14 days of darkness.)

13: *What items would you need for a closed biosphere? What things would be recycled? What things would have to come from Earth?*