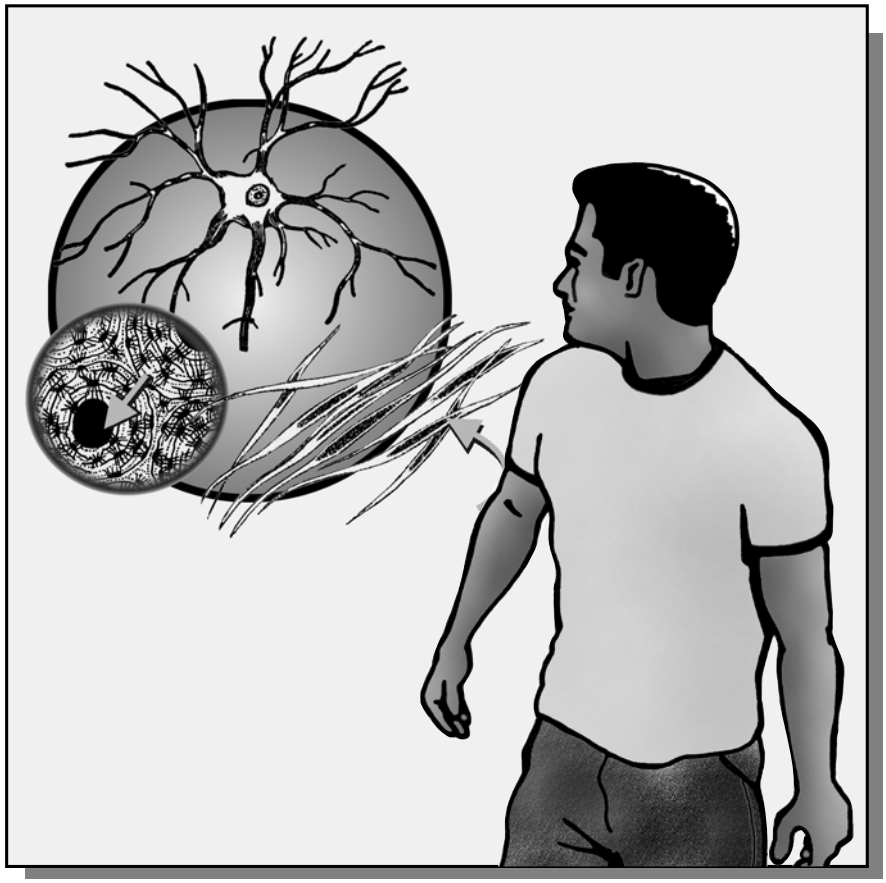
Basic Science Mysteries

Activities



Chapter 4

BSM 62940

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PROFESSIONAL CREDITS

Basic Science Mysteries

Chapter 4

Publisher and Managing Editor
Ronald E. Johnson, Ph.D.

Writers
Dennie Lindsey
John Hudson Tiner

Editors
David Browder
Nancy Johnson
Sarah Johnson

Production Manager
H. Michael Young

Page Composition
Randy Burch
Kathy L. Dial
Pamela K. Hurst
Amy Luna
Holly Creacy Williams
H. Michael Young

Graphic Artists
Randy Burch
Pamela K. Hurst
Lydia Johnson
Amy Luna
Michael Tummillo
Holly Creacy Williams
H. Michael Young

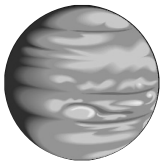
Quality Assurance
Nancy Johnson
Sarah Johnson
Lisa Weber
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ACTIVITIES
Lesson 1:
Astronomy



Far Away Distances

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. From the **context** of the story, we could assume that for you to have taken instruction from someone from another country or of a different nationality, you might have had to set aside any: _____.
   (a) pride and prejudice
   (b) time with you dog
   (c) Maria's soccer techniques
   (d) practicing on fundamentals

2. Working on ***fundamentals*** means to work on skills that are: _____.
   (a) advanced
   (b) basic
   (c) personal
   (d) remedial

3. Which of these activities would you expect an ***astronomer*** to do? _____
   _____
   (a) study astrology
   (b) work with cancer research
   (c) study the stars
   (d) develop a system for purifying water

4. What would you find in an ***observatory***? _____
   (a) microscopes
   (b) telescopes
   (c) medical equipment
   (d) fish tanks

5. Travel distances can be measured by _____ or a linear measurement such as _____ or _____.

6. The United States is bordered on the north by _____, on the south by _____ and by _____ on both the east and west coasts.

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7. In order to **estimate** your average speed on any trip you would need to know: _____ _____.
   (a) your speed on the open road
   (b) your speed in the cities
   (c) the length of stops you made
   (d) all of these
   (e) a and b only

8. Complete the wording of the formula for the time required to complete a trip:
   t _____ = d _____ / s _____

9. What unit of measure does Mexico (and most other nations) use to measure distances from one place to another? _____

10. When you want to convert ***kilometers*** to miles, by what number do you multiply? _____

11. Using the same number (0.62), what process would you use to change miles to kilometers? _____
    (a) addition
    (b) subtraction
    (c) multiplication
    (d) division

12. Units of measurement on Earth work well in space. (a) True or (b) False

13. Express the distance from the Earth to the Sun in miles. _____

14. Express the distance from the Earth to the Sun in kilometers. _____

15. Which terms best describe distances in space? _____
    (a) big/very large
    (b) large/telescopic
    (c) enormous/immense
    (d) miniscule/microscopic

16. ***Astronomical units*** are used by astronomers to measure: _____ _____.
    (a) long distances on Earth in kilometers
    (b) vast distances in space
    (c) distance from Earth to Pluto in place of kilometers
    (d) tiny pieces of equipment in their observations

17. Express the distance from the Earth to the Sun in AUs. _____

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Answer questions #18-22 based on the chart on page 7 of your text that gives distances from the Sun expressed in kilometers and in astronomical units.

18. Which planet is closest to the Sun? _____

19. Which planet is farthest from the Sun? _____

20. The planet _____ is 778,400,000 km from the Sun.

21. How many km are in 0.723 AUs? _____

22. In what order are the planets listed in this chart? _____
    (a) alphabetical
    (b) according to largest diameter
    (c) the planet closest to the Sun listed first
    (d) the planet closest to the Sun listed last

23. Your correspondence with Maria so far in the story had been: _____
    _____.
    (a) in person and by email
    (b) in person and by phone
    (c) in person and by written letters
    (d) only a and b

24. Write the **Life Principle:** *"*_____
    _____*."*

Use the Options for Traveling chart on page 4 of your text to answer questions #25-26.

25. How many days would be needed to complete a 3,000 mile trip, traveling at 50 mph (miles per hour), if you traveled 10 hours each day? _____
    (a) 5 (b) 6 (c) 10 (d) 12

26. How many hours would be required to complete the trip if you traveled at 60 mph (miles per hour)? _____
    (a) 50 (b) 60 (c) 100 (d) 80

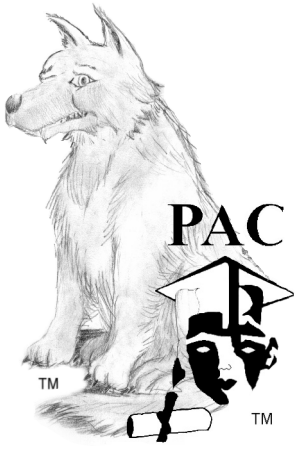
Answer questions #27-29 using the formula t = d/s. Show your work.

27. How much time is required to travel a distance of 100 miles if the average speed is 50 mph? _____ hour(s)
    (a) 1 (b) 2 (c) 3 (d) 4

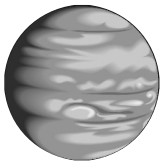
28. How much time is needed to travel a distance of 360 miles if the average speed is 60 mph? _____
    (a) 5 hours (b) 6 hours (c) 7 hours (d) 8 hours

29. What distance would you travel if the average speed were 70 mph and took 5 hours?
    _____
    (a) 350 miles (b) 360 miles (c) 100 miles (d) 1,100 miles

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ACTIVITIES
Lesson 2:
Astronomy

The Sun

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. From this story episode, we can **conclude** that building the endurance you needed for soccer competition would require: _____.
   (a) scheduling and discipline
   (b) patience and perseverance
   (c) both a and b
   (d) neither of these

2. During sunset, the Sun appears to sink below the ***horizon*** because: _____
   _____.
   (a) the Sun moves across our sky from east to west
   (b) the Sun moves across our sky from west to east
   (c) the Earth is spinning
   (d) the horizon is surrounded by a low cloud cover

3. What was Polish astronomer Nicolaus Copernicus first to publicize about the relationship between the Earth and the Sun? _____
   _____
   (a) The Earth revolves around the Sun.
   (b) The Sun revolves around the Earth.
   (c) The Sun supplies the Earth with energy.
   (d) Plants use energy from the Sun in the food-making process of photosynthesis.

4. ***Energy*** from the Sun sustains life on planet Earth. _____
   (a) True or (b) False

5. All energy in an ecosystem begins with: _____.
   (a) plants (b) animals (c) the Sun (d) photosynthesis

6. The food making process in plants is called _____.

7. If the Sun is about average in size for a star, why does it appear so bright? _____
   _____
   (a) Its gases are hotter than other stars.
   (b) It is much larger than scientists think.
   (c) It is much closer to Earth than any other star.
   (d) Its sunspots are much larger than other stars.

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8. The Sun is a huge ball of gases made up primarily of _____% _____ and _____% _____.

9. When a ***nuclear reaction*** takes place on the Sun, what is the result? _____
_____
(a) Nuclear energy is produced.
(b) Nuclear fission occurs.
(c) Protons begin to burn.
(d) Electrons begin to cool.

10. The Sun consists of a series of layers. _____ (a) True or (b) False

11. Nuclear fusion occurs _____ of the Sun.
(a) at the core (b) on the surface (c) in the sunspots (d) in the corona

12. What is the hottest part of the Sun? _____
(a) center (b) surface (c) sunspot (d) corona

13. **Refer to the chart in your text.** Which is the coolest part of the Sun? _____
(a) center (b) surface (c) sunspot (d) corona

14. List the layers of the Sun from hottest to coolest: _____, _____, _____, _____, _____, _____.

15. Scientists avoid eye damage when studying the Sun by using a series of pools of water to reflect the Sun on a large screen and by studying that reflection.
(a) True or (b) False

16. Cool, dark areas on the Sun's surface are called: _____.
(a) radiation zones (c) photospheres
(b) convection zones (d) sunspots

17. Sunspots occur in the Sun's: _____.
(a) chromosphere (c) photosphere
(b) corona (d) radiation zone

18. Gases move at a rapid rate in a sunspot. _____ (a) True or (b) False

19. Sunspots appear darker than the areas around them because: _____
_____.
(a) cooler gas shines less brightly than hotter gas
(b) cooler gas shines more brightly than hotter gas
(c) they occur in craters which causes a shadow to fall over them
(d) they reflect light at an angle

20. The Italian astronomer, _____, in the 1500s was the first to identify _____.

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21. ***Sunspot maximums*** affect Earth's _____ and _____.

22. What did scientists learn by studying the sunspots? _____
_____

(a) The Sun is a star. (c) The Sun does not rotate.
(b) The Sun rotates. (d) The Earth revolves around the Sun.

23. The Sun rotates faster at its equator than at its poles. _____
(a) True or (b) False

24. ***Prolonged*** exposure to ***ultraviolet rays*** from the Sun can cause _____, _____, _____, or _____.

25. In the story episode, you (**effect:**) disregarded your dog's warning be**cause** you were _____.

(a) angry with the dog for disturbing you
(b) doing some cool-down exercises
(c) watching a beautiful sunset
(d) tired and inattentive to your surroundings

26. Write the **Life Principle:** *"*_____
_____*."*

Use the following table to answer questions #27-28.

Necessary for ***photosynthesis***
Affects air and water masses
Affects changes in weather patterns
Affects ocean currents
Can be transformed into heating and lighting appliances
Can run batteries and fuel cars

27. Which would be the best title for this table? _____

(a) The Theory of Nicolaus Copernicus (c) Energy From the Sun
(b) Energy From the Earth (d) The Sun is Earth's Closest Star

28. Which phrase relates to the life processes being carried out by plants in an ecosystem?
_____

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Use the data from the following table to answer questions # 29-30.

Sunspot Activity	
1964	**11**
1965	**18**
1966	**53**
1967	**91**
1968	**106**
1969	**105**
1970	**104**
1971	**64**
1972	**69**
1973	**38**
1974	**35**

29. Which group of years represents a sunspot maximum? _____
    (a) 1964, 1965, 1966
    (b) 1967, 1973, 1974
    (c) 1971, 1972, 1973
    (d) 1968, 1969, 1970

30. If sunspot maximums occur every eleven years, which set of dates shows when the next maximum period should occur? _____
    (a) 1972, 1973, 1974
    (b) 1979, 1980, 1981
    (c) 1983, 1984, 1985
    (d) 1974, 1984, 1994

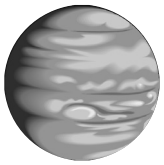
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Name: _____

Date: _____ Grade: _____

ACTIVITIES
Lesson 3:
Astronomy



Mercury

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Astronomers chose the name *Mercury* for the planet in our solar system closest to the Sun because it has a core of mercury. _____ (a) True or (b) False

Use the table in your text to answer questions 2-5.

2. Which planet has the fastest orbital speed? _____
3. Which planet has the slowest orbital speed? _____
4. What is the orbital speed of Earth? _____ km/s
5. What is the orbital speed of Mercury? _____ km/s
6. Name the four ***terrestrial planets***. _____, _____, _____, _____
7. What do the terrestrial planets have in common? _____
   (a) orbital speed
   (b) size and composition
   (c) distance from the Sun
   (d) time of rotation
8. On the ***Celsius*** scale, water boils at _____ and freezes at _____.
9. On the ***Fahrenheit*** scale, water boils at _____ and freezes at _____.
10. The planet, _____, is closest to the Sun.
11. What is the range of temperature on Mercury using the Celsius scale? _____
    (a) 810º to -290º
    (b) 100º to 0 degrees
    (c) 212º to 32º
    (d) 425º to -175º
12. According to Celsius and Fahrenheit data, temperatures on Mercury would drop _____ degrees Celsius or _____ degrees Fahrenheit, going from the daylight to the night side of the planet.
13. The term, _____, refers to a planet spinning on its axis; while _____ refers to planets traveling around the Sun.

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Use the following table to answer questions #14-17.

	Mercury	Earth
Period of Rotation	**58 days**	**24 hours**
Period of Revolution	**88 days**	**365 days**

14. What is the period of rotation for Mercury? _____

15. What is the period of rotation for Earth? _____

16. _____ has the longer period of rotation.

17. _____ has the longer period of revolution.

18. Describe the surface of Mercury. _____
    (a) hills covered with trees
    (b) mountains with snow
    (c) pitted with craters
    (d) covered with lava

19. We know what the surface of Mercury is like because: _____
    _____.
    (a) a manned spacecraft landed there in 1974 and again in 1975 and took pictures
    (b) an unmanned spacecraft passed by the planet in 1974 and 1975 and sent back photographs
    (c) astronauts explored the cool side of the planet in 1974
    (d) none of these

20. ***Meteors*** are sometimes called "_____."

21. What do scientists think causes Mercury to have a magnetic field? _____
    _____
    (a) craters made from meteors
    (b) its orbital speed
    (c) sodium and potassium in its atmosphere
    (d) a liquid iron compound in its outer core

22. **Compare** the size of Mercury with Pluto: _____
    (a) Mercury is smaller than Pluto.
    (b) Pluto is larger than Mercury.
    (c) Mercury is the second smallest planet (after Pluto).
    (d) Pluto is the second smallest planet (after Mercury).

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23. Temperatures drop so drastically between the daylight and night sides on Mercury because: _____.
    (a) little or no atmosphere exists to hold in the heat
    (b) the wind circulates across the ice cap
    (c) the craters are so deep that cold air escapes at night
    (d) a mass of cool gas circulates throughout the planet

24. What was discovered in Mercury's polar regions? _____

25. The diameter of Mercury is _____ km.

26. The diameter of Earth is _____ km.

27. In a size **comparison** of Mercury and Earth, which is the best comparison? _____
    _____
    (a) Earth is a golf ball and Mercury is a baseball.
    (b) Earth is a tennis ball and Mercury is a basketball.
    (c) Earth is a baseball and Mercury is a golf ball.
    (d) Earth is a baseball and Mercury is a soccer ball.

28. Looking from Mercury at the Sun, the Sun would appear _____ than as when seen from Earth.
    (a) larger
    (b) smaller
    (c) about the same size

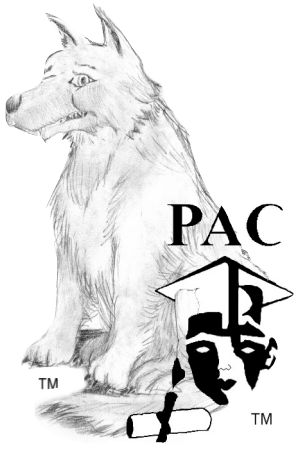
29. We could **infer** that the United States has no plans to send a manned spacecraft to Mercury because: _____
    _____.
    (a) it is too far away
    (b) it is too small for a successful rocket landing
    (c) humans could not survive on Mercury
    (d) Mercury's orbital speed is too fast for landing a spacecraft

30. In the story, to have "winged feet" would **infer** that you: _____
    _____.
    (a) had foot implants to increase running speed
    (b) had a mutant gene resulting in wings growing out of your feet
    (c) were related to the speedy runner, Mercury
    (d) were a very fast runner

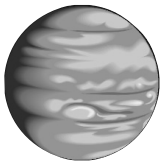
31. Based on the behavior of Princess in this story, the reader could **conclude** that dogs often sense danger before their masters do. _____ (a) True or (b) False

32. Write the **Life Principle:** *"*_____
    _____.*"*

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ACTIVITIES
Lesson 4:
Astronomy

Venus

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Venus is surrounded by: _____.
   (a) a strong magnetic field
   (b) a meteorite shower
   (c) a thick layer of clouds
   (d) weather satellites

2. Fog is: _____.
   (a) a meteorite shower
   (b) emissions from vehicle exhaust
   (c) a cloud that forms close to Earth's surface
   (d) a cloud that contains high levels of sulfuric acid

3. What is the best meaning of the word ***perpetual***? _____
   (a) temporary
   (b) prepared in haste
   (c) prepared with much planning
   (d) permanent

4. ***Carbon dioxide*** gives the clouds surrounding Venus a yellowish color. _____
   (a) True or (b) False

5. Where are the high-speed, upper-level winds of Venus located? _____
   (a) in its upper-middle atmosphere
   (b) on the surface
   (c) high above the planet
   (d) light years into space

6. ***Stagnant*** describes the: _____.
   (a) dense atmosphere near the planet's surface on Venus
   (b) bodies of water on Venus
   (c) upper-level winds of Venus

7. Which illustration is the best **comparison** to the ***greenhouse effect***?
   (a) ice melting in a glass
   (b) heat building up in a parked car with its windows up and doors closed
   (c) getting a suntan at the swimming pool
   (d) a solar eclipse

8. Although Venus is the second planet closest to the Sun, the greenhouse effect makes it the _____ in our solar system.

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9. Logic enables us to **predict** that the greenhouse effect on Earth on a hot day without ventilation (such as in a closed car) could result in death for people or animals.
_____ (a) True or (b) False

10. Since the atmosphere on Venus is much denser than the atmosphere on Earth, the ***atmospheric pressure*** is much _____ on Venus.

11. In what direction does Venus rotate? _____

12. What is different about that rotation? _____

13. What new information did the *Magellan* probe discover on Venus? _____
_____
(a) oceans and polar caps
(b) mountains, valleys and possible volcanoes
(c) a high concentration of carbon dioxide in the atmosphere
(d) a thicker cloud cover than previously thought

14. Due to similar diameter and mass, Venus is sometimes called Earth's _____.

15. In this lesson's beginning story episode, Maria's uncle turned out to be a(n):
_____
(a) NASA team coach (c) astrologer
(b) astronomer (d) computer consultant

16. In the ending story episode, what object or data was stolen from Michael's dad?
_____
(a) his laptop computer
(b) a computer disk with a virus to destroy files
(c) a computer disk with special project data
(d) the hard drives on both his home and office computers

17. Write the **Life Principle**: "_____
_____."

Use the table on page 16 of your text to answer questions #18-20.

18. Which planet has a higher level of carbon dioxide in its atmosphere? _____

19. Which planet has a higher level of oxygen in its atmosphere? _____

20. Which planet has 78.1% nitrogen in its atmosphere? _____

Use the table on page 17 of your text to answer questions #21-23.

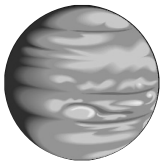
21. Which planet has the larger diameter? _____

22. What is the period of rotation for Venus? _____

23. Which planet has the highest recorded temperature? _____

You have finished Lesson 4 Activities. Score them now to ensure accuracy.

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ACTIVITIES
Lesson 5:
Astronomy

Earth

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The concept that Earth's position in the universe, its atmosphere, rotation and tilt of its axis and numerous other details being perfect to support life is called the _____.

2. In terms of diameter, Earth is an _____ size planet.

Use the table on page 20 of your text to answer questions 3-9.

3. What is the diameter of Earth? _____ km

4. Which planet has the largest diameter? _____

5. Which planet has the smallest diameter? _____

6. Which planet's diameter is closest in size to the diameter of Earth? _____

7. Which planet has a diameter about nine times larger than Earth? _____

8. Which planet has a diameter about half the size of Earth? _____

9. Name the four planets that have diameters smaller than Earth.
_____, _____, _____, _____

10. Which two planets are closer to the Sun than is Earth? _____, _____

11. Earth is slightly ***oblate*** which means: _____.
(a) it travels in an elliptical orbit
(b) it is flattened at the poles
(c) it is flattened at the equator
(d) it is tilted on its axis

12. All the planets, not just Earth, orbit the Sun in ***elliptical*** paths. _____
(a) True or (b) False

13. An elliptical path means that the planet is always the same distance from the Sun at any point on that orbit. _____ (a) True or (b) False

14. For Earth, ***perihelion*** occurs on January 2nd. What happens on January 2nd?
_____
(a) Earth is closest to the Moon.
(b) Earth is closest to the Sun.
(c) Earth is farthest from the Sun.
(d) Earth is farthest from the Moon.

15. How long is required for the Earth to revolve around the Sun? _____

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16. One year is a reference to the rounded time period of _____ days.

17. How long is required for Earth to rotate on its ***axis***? _____

18. Round that time to the nearest hour. _____

19. Which is longer, the period of rotation or the period of revolution? _____

20. Without Earth's rotation, we would not have _____ and _____ or curved, global _____.

Match these concepts.

21. _____ Evidence that Earth rotates
22. _____ Crust plus upper shell of the mantle
23. _____ Center of the Earth
24. _____ 78% nitrogen, 21% oxygen, 1% other

(a) core
(b) lithosphere
(c) day and night
(d) atmosphere

25. According to the Anthropic Principle, the reader could logically **infer** that Earth is the result of:_____.
    (a) a series of cosmic accidents (c) both a and b
    (b) a complex plan and purpose (d) none of these

26. Give three evidences that support the concept in question 25:
    _____;
    _____;
    _____.

27. In this lesson's beginning story episode, which word would **summarize** how you felt about your environment? _____
    (a) contented (b) discontented (c) bored (d) angry

28. In this closing episode of the story, you realized that be(**cause:**) you had built up your endurance, (**effect:**) you had _____
    (a) increased your jogging distance (c) run all the way to LaToya's house
    (b) run all the way to Michael's house (d) been surprised to see Michael at your practice

29. Write the **Life Principle:** *"*_____
    _____*."*

Note: Ask your teacher for the quiz over topics 1-5 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!



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Name: _____

Date: _____ Grade: _____

ACTIVITIES
Lesson 6:
Biology



Life on Earth

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. From the story, name the 3 dogs in order of age: _____, _____, _____.
2. Life is _____ even to the single cell, the _____ block of all living things.
3. A single _____ has the capacity to produce thousands of different ***proteins*** and other ***molecules***.
4. Growth, repair, and communication are functions that take place in every cell.
   _____ (a) True or (b) False
5. Why is protein essential? _____
   (a) It prevents heart attacks.
   (b) It is essential for growth and tissue repair.
   (c) It is essential for the release of stomach acids.
   (d) It regulates calcium.
6. Body cells exhibit an amazingly complex security system. _____
   (a) True or (b) False
7. Cells form _____ which form _____ which form multi-celled, living _____.
8. In the story, what helped you understand the growth and development of Princess?
   _____
   (a) watching Candy and her puppies
   (b) watching the birth process
   (c) reading about the growth and development of dogs
   (d) finding a litter of puppies in your town to study
9. Scientists look for _____ to test whatever ***hypotheses*** they have formulated.
   (a) protein
   (b) similar hypotheses
   (c) empirical data
   (d) the Law of Biogenesis

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10. Living things always produce offspring like themselves. _____
(a) True or (b) False

11. One concept of the origin of life on Earth is that it came about by _____ and _____.

12. The concept that life went from simple to complex by chance over time is the basis of: _____.
(a) the Theory of Evolution
(b) empirical data
(c) the fossil record
(d) a hypothesis

13. British naturalist _____ published *On the Origin of Species* and other books that popularized the Theory of _____.

14. Darwin theorized that evolution took place by means of ***natural selection*** in which organisms kept and transmitted _____ traits to their offspring, while rejecting _____ traits.

15. After 140 years, scientists were finally able to prove the Theory of Evolution.
(a) True or (b) False

16. Darwin formulated his theory without knowledge of the Laws of _____.

17. One major life form (such as reptiles) changing into a different major life form (such as birds) is called _____ evolution.

18. Only certain scientific data that has been proven over time to be true, without exception, is called a scientific _____.
(a) theory (c) hypothesis
(b) law (d) conclusion

19. Living things reproducing offspring that are like their own kind illustrate the Laws of _____.

20. Which is the best example of the Laws of Heredity? _____ _____
(a) simple organisms evolving into more complex creatures
(b) a cat giving birth to kittens
(c) discovering the ancient remains of a dinosaur
(d) a bike rusting in the backyard

21. The Law of _____ states that every living thing must come from some other living thing.

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22. Which is the best example of the Law of Biogenesis? _____
_____
(a) identifying the parents of an offspring
(b) a cat giving birth to kittens
(c) discovering the ancient remains of a dinosaur
(d) a bike rusting in the backyard

23. Evidence of once-living things is found in the _____.

24. Which is an example of the Fossil Record? _____
_____
(a) simple organisms evolving into more complex creatures
(b) a cat giving birth to kittens
(c) discovering the ancient remains of a dinosaur
(d) a bike rusting in the backyard

25. That all systems move from an ordered state to a disordered one illustrates the Second Law of _____, or the Law of _____.

26. Which is an example of the Law of ***Entropy***, or the Second Law of Thermodynamics?
_____
(a) simple organisms evolving into more complex life forms
(b) a cat giving birth to kittens
(c) discovering the ancient remains of a dinosaur
(d) a bike rusting in the backyard

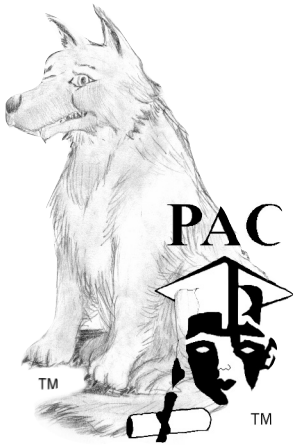
27. Empirical (observable) data supports the theory that life began with basic, complex _____ and produced many different _____ of those basic life forms.

28. The lack of transitional fossils and the clear violation of many laws of science serve to refute _____ as a scientific fact.

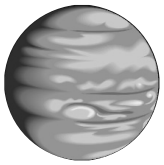
29. In the story, (**effect:**) Mr. Rollins appeared to be disturbed be(**cause:**) _____
_____
(a) he did not want you bothering Candy's puppies
(b) you were sitting too close to Michael
(c) you and Michael were using the computer
(d) none of these

30. Write the **Life Principle:** *"*_____
_____*."*

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ACTIVITIES
Lesson 7:
Astronomy

Mars

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Astronomers in previous centuries believed that life existed on Mars. _____
   (a) True or (b) False

2. Astronomer Giovanni Schiaparelli's belief centered around _____ on Mars.
   (a) the temperature range
   (b) the dust storms
   (c) seasonal color changes
   (d) the polar caps

3. The "canals" were ***optical illusions*** that proved to be: _____.
   (a) craters
   (b) volcanoes
   (c) seasonal color changes
   (d) streaks of dust

4. What did American astronomer Percival Lowell propose about life on Mars? _____
   _____
   (a) It did not exist.
   (b) Canals were built to carry water from wet regions to dry regions.
   (c) Seasonal color changes indicate that plants are in bloom.
   (d) Photosynthesis occurs during the summer.

5. Two authors who were influenced by Percival Lowell were _____ and _____.

6. Early astronomers thought Mars' bright areas were land forms and the dark areas were seas.
   (a) True or (b) False

7. Pictures from the *Mariner* spacecraft launched in the 1960s to explore Mars revealed that: _____.
   (a) the bright areas were land patches
   (b) the dark areas were seas
   (c) the canals were built by an early civilization
   (d) the presence of impact craters on Mars like those on Earth's Moon

8. One of the instruments on the *Viking* probe was designed to detect _____ molecules, which if found would have indicated the presence of life.
   (a) inorganic (b) iron oxide (c) organic (d) carbon dioxide

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9. **Contrast** the temperature on Mars with the temperature at Antarctica.
   (a) somewhat colder (b) much colder (c) warmer (d) much hotter

10. What causes the northern polar ice cap on Mars to decrease considerably?
    _____
    (a) The carbon dioxide vaporizes. (c) The winds from the equator cause it to melt.
    (b) The iron oxide vaporizes. (d) The icebergs break off and drift away.

11. In the planetary lineup from the Sun, Mars is in _____ place.

12. Like Earth, Mars' seasons are caused by: _____.
    (a) its moons (c) its distance from the Sun
    (b) its diameter (d) its tilt on its axis

13. A year on Mars is _____ days and Martian seasons are _____ months long.

Use the table in your text to answer questions #14-18.

14. What is the diameter of Mars? _____

15. Which planet is smaller? _____

16. Mars is about _____ the size of Earth.
    (a) one-half (b) one-fourth (c) one-third (d) twice

17. Which planet has a longer period of rotation? _____

18. Which planet has a longer period of revolution? _____

19. What causes Mars to appear red? _____
    (a) photosynthesis (c) *Olympus Mons*, the volcano
    (b) iron oxide in the rocks (d) *Valles Marineris*, the large canyon

20. What is unusual about Phobos? _____
    (a) its size (b) its shape (c) the way it revolves (d) its core

21. The red planet's atmosphere lacks _____, and so allows harmful ultraviolet rays from the Sun to penetrate the atmosphere.

22. So far, scientific data proves life on Mars is non-existent. (a) True or (b) False

23. In this lesson's beginning story episode, "Mr. Rollins seemed very *disgruntled*." From the **context** of the story, Mr. Rollins was: _____
    (a) sad (b) irritated (c) angry (d) overly polite

24. Maria's uncle had been *detained* at the border. In **context** of the story, this means he had been: _____.
    (a) arrested (b) deported (c) delayed (d) robbed

25. Write the **Life Principle:** *"*_____
    _____."

Congratulations! You are ready to score your work and continue to the next lesson.

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ACTIVITIES
Lesson 8:
Physics

Everything is Moving

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. What force holds the planets together and their atmospheres in place? _____

2. Upon what does the pull of ***gravity*** depend? _____
   (a) acceleration and rotation
   (b) velocity and friction
   (c) mass and distance
   (d) relative motion and mass

3. The composition of the group of planets farthest from the Sun is solid rock.
   _____ (a) True or (b) False

4. Which is true of non-terrestrial planets (**contrasted** with terrestrial planets)? _____
   _____
   (a) They are composed mainly of gases and are less dense.
   (b) They are composed mainly of rock and dirt and are less dense.
   (c) They are closest to the Sun.
   (d) Their average size is smaller.

Answer questions #5-10 based on the table in your text.

5. Which planet is the most dense? _____ Least dense? _____

6. Which planet has the strongest force of surface gravity? _____

7. Which planet is over 300 times larger than Earth? _____

8. Which planet has the least amount of mass? _____

9. What is the density of Mars? _____

10. Which two planets have the same surface gravity? _____ and
    _____

11. If every object in space has ***gravitational attraction***, why do neighboring planet's not collide? _____
    (a) They have too much mass.
    (b) Their surface gravity is too strong.
    (c) Their attractions are balanced.
    (d) They have zero velocity.

12. _____ formulated the Law of Gravity.

13. Newton's First Law of Motion states that all objects resist change in motion.
    _____ (a) True or (b) False

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14. What can you do to change the ***velocity*** of an object? _____
(a) apply force (c) determine the gravitational attraction
(b) determine its mass (d) calculate its inertia

15. Which experiment would demonstrate Newton's First Law of Motion? _____
_____
(a) recording how long you talk on the telephone
(b) a ball bouncing off the wall
(c) determining the mass of three apples
(d) using a battery to illuminate a light bulb

16. What would be an example of moving at a constant velocity? _____
_____
(a) a car coming to a stop sign, stopping and starting again
(b) a train traveling at 50 mph
(c) a person warming up, jogging and then cooling down
(d) a squirrel jumping from one tree limb to another

17. Rougher surfaces result in greater _____.

18. **Review and compare.** The Law of ***Inertia*** is essentially the same as Newton's First Law of Motion. _____ (a) True or (b) False

19. On Earth, what effect do air resistance and gravity have on moving objects? _____
_____
(a) none (b) speeds them up (c) slows them down (d) keeps them constant

20. (**Effect:**) Heavenly bodies in outer space keep moving be(**cause:**) _____
_____
(a) of air resistance and friction
(b) the orbits are elliptical
(c) there is no air and the gravitational attraction is balanced
(d) gases in the atmosphere are so light that they float

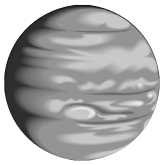
21. Isaac Newton is considered to be the greatest scientist that ever lived. _____
(a) True or (b) False

22. If everything in the universe is moving, which of the following explains why we do not feel like we are moving? _____
(a) gravitational attraction (c) force and motion
(b) mass and inertia (d) relative motion

23. An appropriate title for this story's episodes would be: _____
(a) Goalie Scores Touchdown (c) NASA Team Scores Big
(b) Maria's Team Scores Again (d) Practice Makes Perfect

24. Write the **Life Principle:** "_____
_____."

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ACTIVITIES
Lesson 9:
Astronomy

Jupiter

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. **Compare** the planets. Which characteristic is similar among the nine planets? _____
   _____
   (a) Their compositions are the same. (c) They revolve around the Sun.
   (b) Their sizes are nearly equal. (d) Their masses are comparable.

2. **Compare** the planets' orbits. How are they similar? _____
   (a) circular (b) elliptical (c) vertical (d) horizontal

3. What characteristic was used to classify a planet as either terrestrial or gaseous? _____
   (a) orbital speed (b) diameter (c) mass (d) composition

4. In order from the Sun, list the terrestrial planets. _____,
   _____, _____, _____

5. In order from the Sun, list the gaseous giants. _____,
   _____, _____, _____

6. What word can be spelled by using the first letter of each of the last three gaseous giants? _____

7. Which planet is furthest from the Sun? _____

8. Into which **category** does the furthest planet fit? _____
   (a) terrestrial (b) gaseous (c) both (d) neither

9. Jupiter is the _____ planet from the Sun and the _____ planet in our solar system.

Use the table in your text to answer questions 10-14.

10. What is the diameter of Jupiter? _____

11. Which has a faster rotation? _____

12. Which has a faster orbital speed? _____

13. What is the period of revolution for Jupiter? _____

14. Which planet has the longer period of revolution? _____

15. Jupiter is the only gaseous giant that has a solid surface. _____
    (a) True or (b) False

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16. The temperature and pressure at Jupiter's core is not enough to cause the ***fusion*** of hydrogen. What does that data imply? _____
_____
(a) It causes an increase in orbital speed.
(b) It causes a magnetic field.
(c) It causes Jupiter to be a planet, not a star.
(d) It causes Jupiter to have a strong gravitational attraction.

17. Describe the outer cloud covering of Jupiter. _____
(a) a red and orange mixture (c) oxygen gas
(b) stripes of different colors (d) circles of red

18. Of what composition are Jupiter's clouds? _____
(a) swirling gases (c) liquid nitrogen and water vapor
(b) molten rock particles (d) dust particles

19. What is the Great Red Spot of Jupiter? _____
(a) a red sea (c) a band of helium and hydrogen gas
(b) an atmospheric storm (d) a gigantic, active volcano

20. _____ is known as the Father of Modern Science.

21. What did Galileo discover about Jupiter? _____
(a) sixteen moons (c) four moons
(b) it has volcanoes (d) a core of molten rock and iron

22. Whom did Galileo credit with allowing that discovery? _____

23. Who promoted the concept that Earth orbits the Sun and influenced the discoveries and thinking of Galileo? _____
(a) Voyager (b) Copernicus (c) Rollins (d) Io

24. _____ is known as the Founder of Modern Astronomy.

25. What name has been given to the first four moons discovered to orbit Jupiter?
_____
(a) the Copernicus moons (c) the Renaissance moons
(b) the Voyager moons (d) the Galilean moons

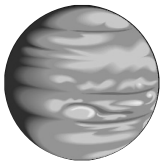
26. What is unusual about the moon, Io? _____
(a) It is as large as the planet Mercury. (c) It is made of ice and rock.
(b) It has active volcanoes. (d) It has rings.

27. In this lesson's beginning story episode, you discovered that (**effect:**) Mr. Rollins carefully trained and cared for Candy be(**cause:**) _____
_____.

28. Write the **Life Principle:** *"*_____
_____*."*

You are becoming a scholar! Continue to the next lesson.

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ACTIVITIES
Lesson 10:
Astronomy

Saturn

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Saturn is ***unique*** among the planets because of its: _____.
   (a) rings (b) temperature (c) size (d) color

2. The purpose of Saturn's rings is to act as a magnetic barrier to prevent asteroids from entering its atmosphere. _____ (a) True or (b) False

3. _____ was the first to discover Saturn's rings in 1610.

4. Dutch astronomer Christian Huygens correctly described the rings as being in an ***ecliptic*** shape around the planet. _____ (a) True or (b) False

5. Saturn's ***ecliptic*** rings are: _____.
   (a) solid
   (b) small chunks of frozen material
   (c) gases
   (d) liquid hydrogen

6. Saturn's rings can be described as broad rings, each of which is made up of hundreds of smaller, narrower rings. _____ (a) True or (b) False

7. Saturn is the next to the largest planet in size. (a) True or (b) False

8. Which statement best describes the ***density*** of Saturn **compared** to the other planets?
   _____
   (a) most dense (b) least dense (c) about the same

9. In **comparing** the density of Saturn to the density of Earth, which illustration is the best?
   _____
   (a) Saturn is a bowling ball and Earth is a marble.
   (b) Saturn is a marble and Earth is a Styrofoam ball.
   (c) Saturn is a Styrofoam ball and Earth is a marble.
   (d) Both are baseballs.

10. Saturn has more _____ than any other planet.

11. What is the largest of Saturn's 18 moons? _____

12. What are the two main gases found in Saturn's atmosphere? _____
    _____
    (a) methane and nitrogen
    (b) methane and ammonia
    (c) oxygen and nitrogen
    (d) hydrogen and helium

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13. Which word best describes the equatorial winds of Saturn? _____
(a) weak (b) strong (c) fierce (d) mild

14. (**Effect:**) Saturn is often described as the most _____ of the planets be(**cause:**) of _____.

15. The **main idea** of the closing story episode of this lesson is: _____ _____.
(a) violent storms happen on Saturn (c) things are not always as they seem
(b) storms are a normal part of weather (d) even storms have secrets

16. Write the **Life Principle:** *"*_____ _____.*"*

Use the following table to answer questions #17-23.

Earth/Saturn Comparisons

	Earth	Saturn
Diameter	**12,756 km**	**120,660 km**
Period of Rotation	**23 hours, 56 minutes**	**10 hours, 39 minutes**
Period of Revolution	**365.26 days**	**29.46 years**
Average Orbital Speed	**29.79 km/s**	**9.64 km/s**

17. What is the diameter of Saturn? _____

18. Which planet has the larger diameter? _____

19. What is the period of rotation for Saturn? _____

20. Which planet has the longer period of rotation? _____

21. Which planet takes 365.26 days to revolve around the Sun? _____

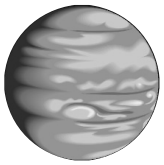
22. Which planet takes longer to revolve around the Sun? _____

23. What is the average orbital speed of Saturn? _____

Note: Ask your teacher for the quiz over topics 6-10 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!



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ACTIVITIES
Lesson 11:
Astronomy

Stars

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. A group of stars that seem to form a "follow-the-dot" picture in the heavens is called a _____.

2. The idea of naming constellations was originated by 20th century astronomers.
_____ (a) True or (b) False

3. What did the International Astronomical Union set forth for 88 constellations in 1930?
_____
(a) names
(b) magnitude
(c) chemical composition
(d) boundaries

4. We could **conclude** that ***constellation*** boundaries were fixed because: _____
_____.
(a) They needed repair.
(b) They were completely broken.
(c) Constellations were becoming too numerous.
(d) More constellations needed to be named.

5. The stars in a constellation are all the same distance from the Earth. _____
(a) True or (b) False

6. Star distance is measured by a special unit called the _____.

7. How many kilometers does light travel per second? _____ How many miles does that equal? _____

8. How many miles does light travel per year? _____

9. Interpret the number of kilometers that light travels per year. _____
_____
(a) 9 billion, 460 million, 800 thousand
(b) 9 trillion, 460 billion, 800 million
(c) 9 million, 460 thousand, 800 hundred
(d) 9 thousand, 468 hundred

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10. Round to the nearest trillion the number of miles per year that light travels. _____
    (a) 5
    (b) 6
    (c) 58
    (d) 59

11. Proxima Centauri is 43,000,000,000,000 km from Earth. What is that approximate distance expressed in ***light years***? _____
    (a) 43
    (b) 4.3
    (c) .43
    (d) .043

12. If Proxima Centauri were to explode tonight, when would we "see" that explosion? _____
    (a) in 43 years
    (b) in 4.3 years
    (c) in 4 months
    (d) in 4,000 years

13. Stars differ in brightness. _____ (a) True or (b) False

14. If you look at two stars and they appear to have the same magnitude, but you know one is larger and hotter, why do they look the same? _____
    _____
    (a) They are in the same constellation.
    (b) They are at different distances.
    (c) They are close to the North Star.
    (d) One is reflecting the light from the Sun.

15. If two stars are the same in every way except size, the _____ one will be brighter than the _____ one.

16. If two stars are the same in every way except temperature, the _____ one will be brighter.

17. **Review question.** Name three things that affect a star's ***magnitude***. _____
    (a) distance, size, shape
    (b) distance, size, location
    (c) distance, size, temperature
    (d) distance, size, rotation pattern

18. What does color reveal about a star? _____
    (a) its distance
    (b) its size
    (c) its shape
    (d) its temperature

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Match these concepts.

19. _____ very hot star
20. _____ cool star
21. _____ ***spectrum***
22. _____ ***prism***
23. _____ ***spectroscope***

(a)bands of color formed when light separates
(b)instrument used to separate light into a spectrum
(c)bluish-white
(d)transparent triangular solid used for separating light
(e)orange or red

24. Determining the spectrum of a star allows scientists to determine its: _____
_____.
(a) distance from the Sun
(b) external temperature
(c) gas and chemical composition
(d) placement in a constellation

25. What is another name for the star Polaris? _____

26. With which is the North Star **NOT** associated? _____
(a) Little Bear
(b) Sirius
(c) Little Dipper
(d) Ursa Minor

27. Constellations that are not near Polaris can be seen only at certain times of the year.
_____ (a) True or (b) False

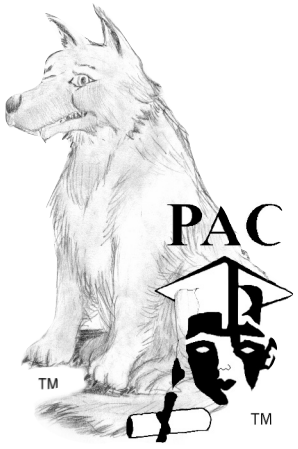
28. _____ is the brightest star and is over twice the size of the
_____.

29. Where do stars "go" during the daytime? _____
(a) They go nowhere.
(b) They revolve around the Sun.
(c) They are behind the Sun.
(d) They are below Earth's horizon.

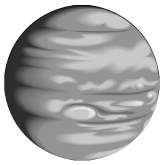
30. In the story, Princess was bothered by: _____.
(a) a telescope (b) a vehicle (c) a soccer ball (d) the darkness

31. Write the **Life Principle:** *"* _____
_____.*"*

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ACTIVITIES
Lesson 12:
Astronomy

Uranus

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Uranus is the _____ planet in order of distance from the Sun.

2. (**Effect:**) Uranus _____ be(**cause:**) it has the greatest ***tilt*** of any planet .

3. While tilted on its side, Uranus also rotates _____ on its axis.

4. **Compare** Uranus and Venus. What do they have in common about their rotations?

   _____
   (a) length
   (b) tilt
   (c) retrograde
   (d) speed

5. Early astronomers believed Uranus to be a: _____.
   (a) planet
   (b) comet
   (c) moon
   (d) star

6. What was the early name given to Uranus? _____

7. Uranus was given its present name during the: _____.
   (a) 16th century
   (b) 17th century
   (c) 18th century
   (d) 19th century

8. In 1977, what did American astronomer James L. Elliot discover about Uranus? _____
   (a) rings
   (b) moons
   (c) density
   (d) atmosphere

9. All the gaseous giants have rings. _____ (a) True or (b) False

10. According to the chart of Ring Systems, _____ has thousands of rings.

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11. Describe the orbital path of Uranus' 21 satellites. _____
(a) sideways (b) backwards (c) north to south (d) south to north

12. Describe the revolution pattern of these moons: _____
(a) north to south (c) no specific pattern
(b) retrograde (d) unknown

13. Describe Uranus' atmosphere. _____
_____
(a) It is mostly hydrogen and helium with traces of methane.
(b) It is stormy and violent.
(c) It is mostly nitrogen and oxygen with traces of methane.
(d) It is mostly hydrogen and helium with traces of oxygen.

14. How does Uranus appear through a telescope? _____
_____
(a) reddish with orange rings
(b) bands of color circle the planet
(c) bluish-green with a faint green circumference
(d) orange with a faint green circumference

Use the following table to answer questions #15-19.

Earth/Uranus Comparisons		
	Earth	**Uranus**
Diameter	**12,756 km**	**51,118 km**
Period of Rotation	**23 hours, 56 minutes**	**17 hours, 14 minutes**
Period of Revolution	**365.26 days**	**84.04 years**
Average Orbital Speed	**29.79 km/s**	**6.81 km/s**

15. Which diameter is 12,756 km? _____

16. Which planet has the larger diameter? _____

17. How long is the period of rotation for Uranus? _____

18. What is the average orbital speed for Uranus? _____

19. Which planet has a faster orbital speed? _____

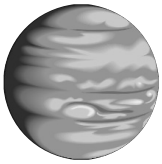
20. From both story episodes in this lesson, you could **infer** the reason Mr. Medrano was kidnapped had to do with the criminals wanting: _____.
(a) Mr. Medrano's passport (c) important information
(b) ransom money (d) Mr. Medrano to leave the United States

21. Write the **Life Principle:** *"*_____
_____*."*

You have finished Lesson 12 Activities. Score them now to ensure accuracy.

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ACTIVITIES
Lesson 13:
Astronomy



Neptune

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Why were mathematicians able to predict the discovery of another planet?

   _____

   (a) Something was affecting the rings around Saturn.
   (b) Something was affecting the orbit of Uranus.
   (c) Something was affecting the orbit of Pluto.
   (d) Something was affecting the retrograde rotation of Venus.

2. In what year did Johann Gottfried Galle discover Neptune? _____

3. Neptune and Uranus are called _____ because of their similar structure and _____.

4. Hydrogen gas in the upper atmosphere gives Neptune its beautiful blue color.
   _____ (a) True or (b) False

5. What does Neptune's core probably contain more of than the other gaseous giants?

   _____

   (a) rock and metal (b) hydrogen (c) helium (d) methane

6. Neptune's rings contain more dust than do the rockier rings of the other planets.
   (a) True or (b) False

7. Why is Neptune sometimes the 8th planet in order of distance from the Sun and at other times the 9th planet? _____

   _____

   (a) Uranus' orbit is so elliptical that it crosses Neptune's orbit.
   (b) The gravitational pull of Uranus is so strong that it pulls Neptune out of its orbit.
   (c) Pluto's orbit is so elliptical that it crosses Neptune's orbit.
   (d) Neptune and Pluto are twins, so they can trade places easily.

8. What are the bright and dark spots in Neptune's atmosphere thought to be? _____
   (a) volcanoes (b) rocks (c) storms (d) frozen methane

9. What is the wind speed on Neptune? _____
   (a) 100 mph (c) 1,500 mph
   (b) 500 mph (d) 155 mph

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10. **Compared** to other planets, wind speeds on Neptune are: _____.
    (a) the least of all
    (b) highest of all
    (c) comparable to others

11. Eight known satellites _____ Neptune.

12. Neptune's largest and brightest satellite is named _____.

13. **Compare and contrast** Candy and Confite. What did they **NOT** have in common?
    (a) Both had the same name.
    (b) Both responded to hand signals.
    (c) Both were good duck hunters.
    (d) Both were ferocious guard dogs.

14. Write the **Life Principle:** *"*_____*."*

Use the following table to answer questions #15-19.

Uranus/Neptune Comparisons		
	Uranus	**Neptune**
Diameter	**51,118 km**	**49,528 km**
Density	**1.03 g/cm^3**	**1.66 g/cm^3**
Mass (E = 1.0)	**14.54**	**17.23**

15. What is the diameter of Neptune? _____

16. Which planet has the larger diameter? _____

17. Which planet is denser? _____

18. What is the mass of Uranus? _____

19. What is the mass of Neptune? _____

Use the following table to answer questions #20-22.

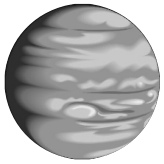
Earth/Neptune Comparisons		
	Earth	**Neptune**
Diameter	**12,756 km**	**49,528 km**
Period of Rotation	**23 hours, 56 minutes**	**16 hours, 3 minutes**
Period of Revolution	**365.26 days**	**164.79 years**
Average Orbital Speed	**29.79 km/s**	**5.43 km/s**

20. Which has a longer period of rotation? _____

21. Which has a longer period of revolution? _____

22. Which has a slower average orbital speed? _____

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ACTIVITIES
Lesson 14:
Astronomy

Pluto

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Even before it was discovered, clues led scientists to believe that Pluto existed.
   _____ (a) True or (b) False

2. Astronomers had expected to find another terrestrial planet instead of what they found.
   _____ (a) True or (b) False

3. Why were astronomers surprised when they found Pluto? _____
   _____
   (a) They were surprised by its shape.
   (b) They were surprised by its size.
   (c) They were surprised by its atmosphere.
   (d) They were surprised by its orbital speed.

4. **Compare** the size of Pluto to Earth's Moon. _____
   _____
   (a) Earth's Moon is smaller.
   (b) Earth's Moon is larger.
   (c) Earth's Moon is the same size as Pluto's Moon.

5. Pluto is sometimes closer to the Sun than Neptune when: _____
   _____.
   (a) their orbits cross
   (b) their gravitational attraction reverses their order
   (c) Pluto rotates slower than Neptune does
   (d) Pluto's orbital speed is slower than Neptune's orbital speed

6. **Compare** the tilt of Pluto's orbit with the orbits of the other planets. _____
   (a) It is the same.
   (b) It is inclined the most.
   (c) It is inclined the least.
   (d) It is sideways.

7. What is the best description of ***absolute zero***. _____
   (a) Water freezes.
   (b) Solids freeze.
   (c) All molecules stop vibrating.
   (d) All gases become frozen vapors.

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8. Pluto's temperature is the _____ of all the planets.

9. Pluto appears to have a yellowish color, according to telescopic data. _____
(a) True or (b) False

10. In 1978, astronomers discovered that Pluto has a moon that is twice the size of the planet.
_____ (a) True or (b) False

11. Be(**cause:**) Pluto and Charon are closer in size than any other planet-moon system in our solar system, (**effect:**) they are sometimes called a "_____."

12. What are the bright and dark areas of contrast on Pluto's surface thought to be:
_____.
(a) nitrogen ice and methane ice
(b) violent storms
(c) hydrogen ice and helium ice
(d) pockets of swirling gas

13. Because it is so unlike the other planets, some astronomers wonder if Pluto should be classified a planet. (a) True or (b) False

14. The new discovery by astronomers officially brings the total number of planets in our solar system to ten. (a) True or (b) False

15. The new heavenly body was named "_____."

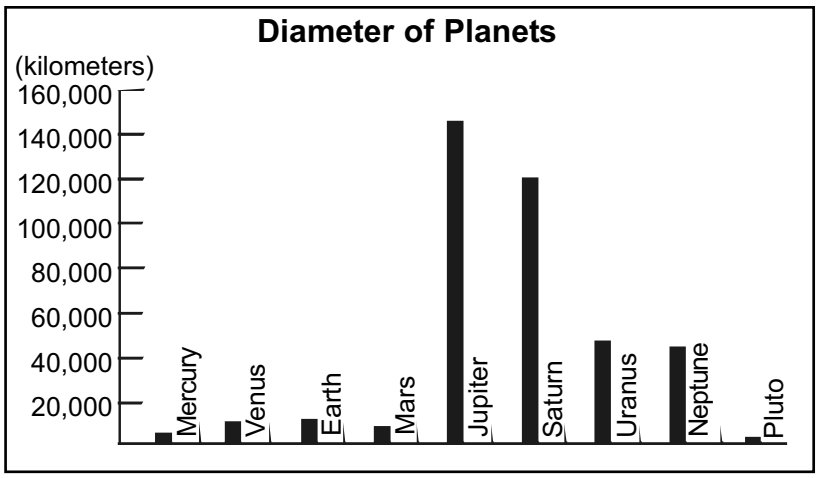
16. The new planet-like object was named for: _____.
(a) the icy nature of its weather
(b) the president of the California Institute of Technology
(c) the native Americans who originally lived in the Los Angeles area
(d) the Indian god of creation

17. In this story episode, the name that held the most promise as a password for opening Mr. Rollins' computer files was: _____.
(a) Candy (b) Confite (c) Dog Star (d) Karina

18. Write the **Life Principle:** *"*_____
_____*!"*

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Use the following bar graph to answer questions #19-22.



19. Which planet has the smallest diameter? _____

20. Which planet has the second smallest diameter? _____

21. Which planet has the largest diameter? _____

22. Which 2 sets of planets are closest in diameter? _____ and _____, _____ and _____

Use the following chart to answer questions #23-26.

Earth/Pluto Comparisons		
	Earth	**Pluto**
Diameter	**12,756 km**	**2,290 km**
Period of Rotation	**23 hours, 56 minutes**	**6 days, 9 hours, 17 minutes**
Period of Revolution	**365.26 days**	**248.53 years**
Average Orbital Speed	**29.79 km/s**	**4.74 km/s**

23. What is the diameter of Pluto? _____

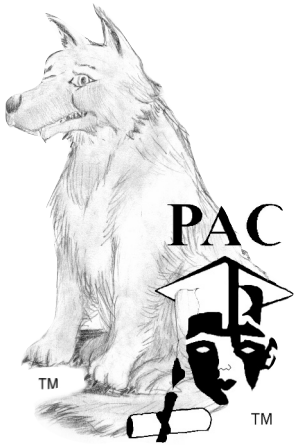
24. What is the period of rotation for Pluto? _____

25. What is the period of revolution for Pluto? _____

26. Which planetary body has the faster average orbital speed? _____

Congratulations! You have finished Lesson 14 Activities. Score your work.

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ACTIVITIES
Lesson 15:
Physics

In the Beginning

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Science involves a search for _____.
2. Scientists look for _____ data, which is information they can see, feel, hear, or touch.
3. Scientists use _____ skills as they search for empirical data.
4. These skills of the scientific method include: _____, _____, _____, _____, _____, _____, _____, and _____.
5. The key to this scientific method is to use the skills _____.
6. Scientists should keep _____ minds as they use the process skills to discover truth.
7. Unfortunately, sometimes scientists assume data that is not really there in an attempt to "prove" preconceived ideas. _____ (a) True or (b) False
8. Only two basic theories exist regarding the origin of the universe and life therein: either it came into being on its own, by _____, or it was _____ on purpose.
9. Which does an evolutionist NOT believe? _____ _____.
   (a) The universe may be the result of intelligent design.
   (b) The universe evolved on its own by chance.
   (c) Life began in a simple way and became complex.
   (d) The universe and life evolved over billions of years.
10. With 4 **key words**, tell how evolutionists support their claims: _____, _____, _____, _____.
11. Those who believe that the universe was created complete and complex by a divine creator are usually called: _____.
    (a) evolutionists (b) creationists (c) designists (d) both a and b
12. Creationists support their position with _____, _____ and _____ plus ancient _____ describing scientific truths hundreds of years prior to their actual discovery.

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13. The Theory of Intelligent Design presumes: _____
_____.
(a) the universe is far too complex to have happened by chance over eons of time
(b) the universe began in a simple way and became more complex over time
(c) the universe has a brain at the core that determines what occurs on the Earth
(d) the universe was designed, then evolved over time

14. Place an "X" in front of each statement that pertains to how intelligent designists support their position.
_____ scientific laws
_____ scientific method
_____ ancient documents
_____ evolutionary suppositions

15. The Big Bang Theory states that the universe began as a concentrated mass of matter.
_____ (a) True or (b) False

16. What is the concentrated mass of matter often called? _____
(a) a gravitational mass
(b) a big mass
(c) a cosmic egg
(d) a red shift

17. What happened to this concentrated mass of matter, according to the Big Bang Theory?
_____
(a) It collapsed.
(b) It duplicated itself.
(c) It exploded.
(d) It turned red.

18. In the light spectrum, what color produces the longest ***wavelengths***? _____
(a) violet
(b) blue
(c) red
(d) black

19. What did astronomer Edwin Hubble suggest that the red shift indicated? _____
_____
(a) The universe is collapsing.
(b) The light in the universe is red.
(c) The universe is becoming lighter.
(d) The universe is expanding.

20. According to the First Law of Thermodynamics (Law of Conservation of Energy/Matter), which question addresses a weakness that appears in the Big Bang Theory?
_____
(a) How can you measure light waves?
(b) Where did the matter in the cosmic egg originate?
(c) How fast can matter travel?
(d) all of these

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21. According to the Law of ***Entropy*** within the Second Law of Thermodynamics, which question addresses a weakness that appears in the Big Bang Theory? _____
_____
(a) If systems left to themselves become disorderly, how did the universe become more complex?
(b) Why does a red shift in the spectrum indicate movement?
(c) Who lit the fuse that caused the explosion?
(d) all of these

22. According to the Law of Conservation of Angular Momentum, which question addresses a weakness that appears in the Big Bang Theory? _____
_____
(a) If radial motion cannot give rise to orbital motion, what made the planets start revolving around the Sun?
(b) Why do the planets vary in composition?
(c) If velocity causes orbital motion, what made the planets obey the Law of Gravity?
(d) all of these

23. According to the Law of Gravity, upon what does gravity depend? _____
(a) mass and distance (c) matter and motion
(b) force and motion (d) weight and matter

24. During an explosion, the distance between the exploded particles becomes greater. According to the Law of Gravity, what happens to the pull of gravity on those particles? _____
(a) The gravitational pull becomes less.
(b) The gravitational pull becomes greater.
(c) The gravitational pull remains the same.
(d) The gravitational pull is not relevant.

25. If the Big Bang Theory is true, and everything in the universe came from the same ***homogeneous*** mixture such as the cosmic egg, then what should we expect about the planets? _____
(a) Their compositions should be different.
(b) Their compositions should be the same.
(c) They should all contain the same amount of water.
(d) Their atmospheres should be different

26. If one part of a theory or exam question is false, the entire thing must be considered false.
_____ (a) True or (b) False

27. For any theory to become scientific fact, _____ components must be validated as _____.

28. Be(**cause:**) speculations and suppositions about the unobservable past cannot be measured by ***tangible*** _____, (**effect:**) such speculations and suppositions do not qualify as _____.

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29. An ethical scientist looks at observable _____, compares it to the _____ of science, and use the _____ skills of the scientific method to reach a conclusion.

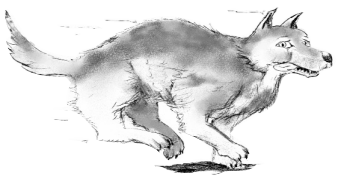
30. You can tell that Newton's response to his scientist friend was designed to: _____ _____.
(a) embarrass the man
(b) point out that the man was ignorant
(c) point out their vast differences in beliefs
(d) encourage the man to think in terms of scientific laws and empirical evidence

31. We could **conclude** by Newton's remarks that he believed the universe was a product of evolution. _____ (a) True or (b) False

32. The characters in this story learned many things through their experiences. List 5 of these from the last paragraph of the story:
_____,
_____,
_____,
_____,
_____.

33. Write the **Life Principle:** *"*_____ _____*."*

Score your work carefully, then ask your teacher for the quiz over topics 10-15. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!



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