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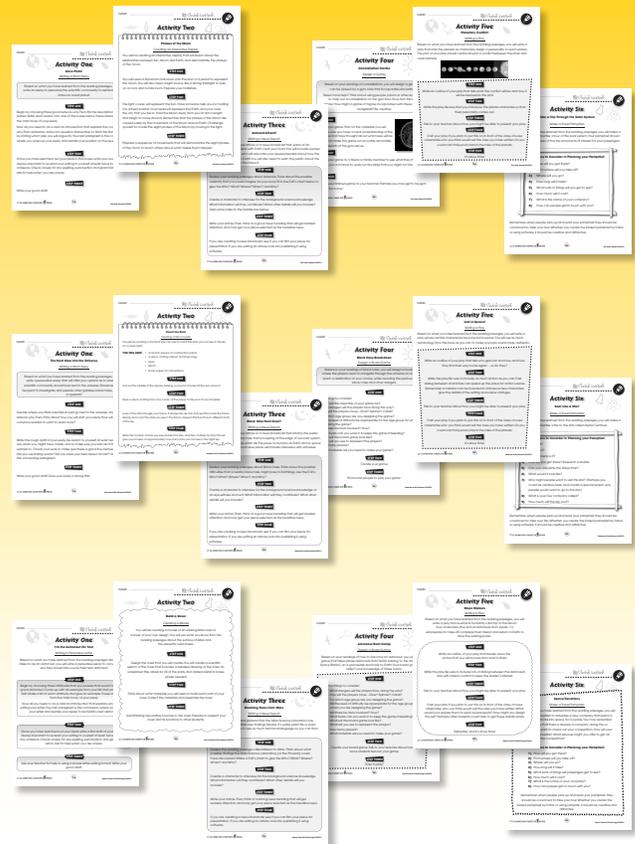
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The Stars

- Have you ever star-gazed before? What do you wonder about when you look up at the stars? Write your answers as a reflection journal in your notebook.
- Complete each sentence with a word from the list. Some words will be left over. You may use a dictionary to help you.

astronomer	moon	astrologist	ice	Sun
asteroids	meteors	eons	light years	constellation
dust	microscope	telescope	navigate	North Star

- The brightest star in our sky is the _____.
- Stars begin as balls of gas and _____ that clump together and get bigger and bigger over time.
- Shooting stars are not actually stars. They are _____.
- Scientists measure the distance between stars using _____. This is the distance that light travels in one year.
- A scientist who studies the stars is called an _____.
- The Hubble space _____ is used to view the stars in the universe.
- Stars have been used by sailors to _____ the ocean for hundreds of years.

- Choose **one** of the words from the list below and find out what it means. Then, match it with a word from the word bank that relates to its meaning.

- _____ nebula
- _____ supernova
- _____ galaxy
- _____ universe

Word Bank
1. explosion
2. cloud
3. whole
4. star system



The Stars

Scientists estimate that there are **trillions** of stars in the universe. You could probably see about 3,000 of them on a clear night if you live in the country. Did you know that stars have a **life cycle**, just like living things? They are born, they grow up, and then they die. A star begins as a cloud of gas and dust, called a **nebula**. As the cloud moves around, it picks up more and more gas and dust. Picture a snowball rolling down a hill and getting bigger and bigger. The star gets really big and hot; eventually it runs out of gas and burns out. The burnt-out star will blow up, shrink or go cold. This whole cycle can take billions of years to happen.



Why can people who live in the country see more stars than people who live near a city?



There are many types of stars. The **Sun** is a star called a **yellow dwarf**. It may seem funny to think of the Sun as a "dwarf" because it seems so much bigger than other stars. Did you know that the Sun is actually much smaller than most stars? It just looks bigger because it is closer to the Earth. Except for our Sun, stars are not part of our solar system because they are so far away. They are part of the **universe**.

Blue stars are much bigger than yellow stars, so they are called **blue giants**. They are very bright and very hot. When they die, they grow larger and larger and then explode into a **supernova**. Supernovas are so bright that they can be seen from very far away. There are even bigger stars than blue giants. They are called **super giant stars**. The largest one you can see with your bare eyes is **Betelgeuse**. It is 700 times bigger than the Sun.



The Stars

- Fill in each blank with a term from the list. Some terms will be left over.

dies	yellow dwarf	red dwarf	shrink
gas	nebula	black hole	farther
millions	closer	Sun	trillions
supernova	blue star	life cycle	shooting stars

A star begins as a dust and gas cloud, called a _____ that continues to pick up more and more dust and gas until it's a burning hot star. As its _____ continues, the star burns up its _____ until it runs out. When this happens, the star _____. After this, the star will explode, _____, or just go cold. If the star is an especially large one, like a _____, it will explode into a _____ which is bright enough to be seen from very far away. The _____ is a much smaller star. It is called a _____ star. It just looks so much bigger to us than other stars because it is _____ to us. There are _____ of stars in the universe, but we can only see about 3,000 of them from Earth.

- Number the events from 1 to 5 in the order they occur in a star's life cycle.

- The dust and gas particles in the star continue to get more and more compact, making the star burn hotter and hotter.
- The nebula continues to gather more and more dust and gas particles.
- A nebula forms from dust and gas particles in a galaxy.
- The star blows up, shrinks, or goes cold.
- The star runs out of gas and burns itself out.



The Stars

Answer each question with a complete sentence.

- Why does the Sun seem so much larger than the other stars, when it is actually a great deal smaller?

- What happens to a star that has died?

- What is a **supernova**?

Research & Extensions

- When some super giant stars die, they leave behind a **black hole**. You may have heard of black holes in science fiction novels, video games, movies, or on television shows.
 - Conduct enough research on black holes using print and/or Internet resources to learn **five** interesting points. Record your five points on the Star Organizer on the next page.
 - Organize your five points into a **paragraph** that explains what a black hole is. Remember to start your paragraph with a topic sentence, then add the details and finish with a concluding statement. Use the Organizer on page 32 to help you.
 - Create a comic strip that includes a black hole in the storyline. You will need to think about what kind of action could take place around a black hole, and then create characters and write a plot for your story. Present it as a 3 to 5-section comic strip.

WEB CONNECTION

To learn more about the Hubble Space Telescope, search the Internet using the words "Hubble telescope". See if you can find pictures of what the sky looks like through the Hubble Space Telescope. Also, look for information on how to make your own telescope!





Test It!

TOYS IN SPACE

In this activity, you will have the chance to make predictions about how traditional toys will work in space. In scientific experiments, we call these predictions **hypotheses**. Then, you will have a chance to **observe** the toys at work and draw a **conclusion**. These steps are part of the scientific process.

Many of the toys that we play with on Earth work well because gravity helps them to function. Have you ever wondered how toys might work in zero gravity conditions? Some toys might be more fun, and some might be less! Complete the first three columns of this chart. Then, go to: http://observe.arc.nasa.gov/nasa/exhibits/toys_space/toyframe.html to watch the toys at work. Complete the final two columns after you watch each toy.

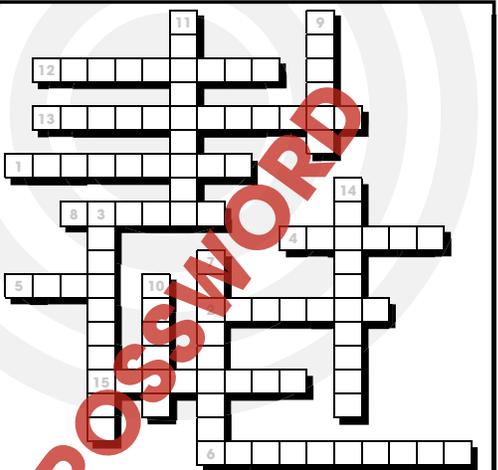
TOY	A) Background: How does gravity help this toy work on Earth?	B) Hypothesis: How will this toy be affected by zero gravity?	C) Observation: What did you learn about how it actually performed in space?	D) Conclusion: Make a statement about what you learned compared to your hypothesis.
1. Ball in Cup 				
2. Jacob's Ladder 				
3. Yo - Yo 				
4. Wind-up Toy 				



Crossword Puzzle!

Word List

- Astronomer
- Black Hole
- Elliptical
- Galaxy
- Gravity
- Interstellar
- Light Year
- Matter
- Milky Way
- Nebula
- Quasar
- Reflection
- Satellite
- Star
- Telescope



Across

1. An object that you cannot really see in space (2 words)
2. A force that tries to pull two objects together
4. An enormous group of star clusters
5. A ball of hot gas
6. One of the types of nebulae
8. The whole universe is made up of these tiny particles
12. The moon is a _____ of the Earth because it orbits around it
13. The space between stars is called this
15. The name of the galaxy that our solar system rotates across (2 words)

Down

3. A scientist who studies the universe
7. A unit used to measure distance in space (2 words)
9. The most distant objects in the universe that we can see
10. A cloud of dust and gas
11. A tool used to see objects in space
14. One of the shapes that a galaxy may take



Comprehension Quiz

2. Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.
 - a) Astronauts at the International Space Station get to watch more than a dozen sunrises and sunsets each day.
TRUE FALSE
 - b) Since the ISS is so large and heavy, special launchers were designed to get the unit into space.
TRUE FALSE
 - c) Crews of the ISS rotate in and out about once per year.
TRUE FALSE
 - d) Microgravity provides us an opportunity to conduct experiments that we couldn't do here on Earth.
TRUE FALSE
 - e) Since astronauts need to keep up their strength, they work very short days, and get lots of sleep.
TRUE FALSE
3. Answer each question with a complete sentence.
 - a) Why is an astronaut an "extraordinary" person?

 - b) Explain the context of the phrase, "The Eagle has landed."

 - c) Give an example from this book that proves "If at first you don't succeed, try, try again."

 - d) Why do so many astronauts and scientists seem so interested in finding evidence of water on other planets and moons?

 - e) Why is the cooperation of many countries needed on a project like the ISS?

The Andromeda Galaxy



Different Shapes of Galaxies



BARRED SPIRAL



ELLIPTICAL



IRREGULAR

NAME: _____



Living in Space



- You've probably already wondered what it would be like to live in space. In your response notebook, pose five "I wonder" statements about life on a space station. For example, "I wonder what kind of food astronauts eat".
- Complete each sentence with a word from the list. Use a dictionary to help you.

crew expensive	disintegrate monitor	assemble experiment	launch
---------------------------------	---------------------------------------	--------------------------------------	---------------

- The baseball hat we wanted was far too _____ for what he was willing to spend.
- Her parents did not realize that they would have to _____ all the parts of the remote controlled car themselves.
- The doctor told the nurse to take the patient's temperature, change his bandages and continue to _____ his breathing.
- Each student in the class had to design their own _____ to show the effect that sunlight and water have on the rate of plant growth.
- The designer decided to save his new handbag for the spring _____ of his new line.
- When they got to the site of the wreck, they knew it would take a whole _____ of trained people to clean up the mess.
- The walls of the riverbank seemed to _____ right before her very eyes as the waters rushed in.

3. Unscramble the words below. These are the words given in the list for question 2. When you unscramble it, write the letter of the sentence from question 2 beside it.

- _____ HULNAC
- _____ ROTNMIO
- _____ EMLSBAES
- _____ GEDSTTIIRANE
- _____ VSNEEEPXI

1. responses will vary; should be a list of 5 I Wonder statements

2. a) expensive

b) assemble

c) monitor

d) experiment

e) launch

f) crew

g) disintegrate

3. a) E

b) C

c) B

d) G

e) A

1. a) disintegrate

b) assemble

c) expensive

d) experiment

e) monitor

f) launch

g) microbe

h) compartment

i) suction

j) engineer

2. a) ~~China, Alaska~~

b) swimming

toothbrush

c) Zvezda, Mir, Salyut

3. a) too big/heavy to launch; easier to assemble in microgravity conditions

b) To catch hairs so that they don't float around and get in the way

c) had experience with Mir; for financial contribution



1. responses will vary

2. a) surface

b) mount

c) robotic

d) scout

e) vaporizing

f) exploration

3. a) C

b) A

c) B

d) D

e) F

f) E

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responses will vary

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EASY MARKING ANSWER KEY