



TEACHER GUIDE

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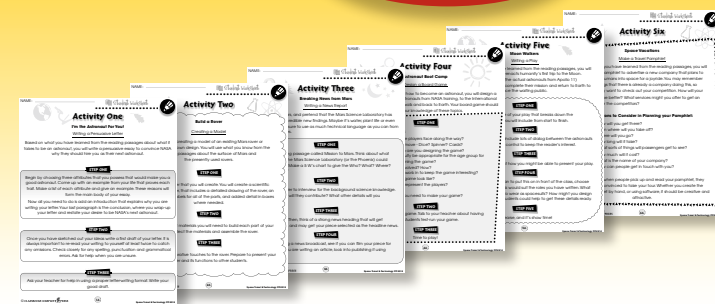
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✓ **6 BONUS Activity Pages!** Additional worksheets for your students

- Go to our website: www.classroomcompletepress.com/bonus
- Enter item CC4514 – Space Travel & Technology
- Enter pass code CC4514D for Activity Pages.

FREE!





Looking Into Space

- Have you ever wanted to see something more close up before? What did you do to get a better look? Describe the situation and what you tried in your response notebook.
- For each term on the left, fill in the matching description from the right. Use a dictionary to help you.

	Terms	Answer	Description
i)	telescope		a) People who study the universe beyond the Earth's atmosphere.
ii)	lunar phase		b) A telescope using a lens to produce an image.
iii)	orbit		c) The path an object makes around another object under the force of gravity.
iv)	astronomers		d) A telescope using a mirror to produce an image.
v)	refractor		e) The appearance of the moon at one point in its cycle. (e.g. a <i>half moon</i>)
vi)	reflector		f) A device used to make distant objects appear nearer and larger.

3. Label the diagram using the words in the list.

microscope, magnifying glass, telescope, binoculars, eyeglasses



A _____ B _____ C _____ D _____ E _____

4. What do all of the objects in question 3 have in common?
- _____
- _____



Looking Into Space

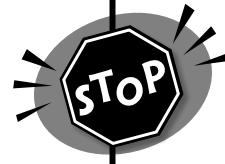
When you look out into space with the naked eye you can see some objects, like stars and planets. If you wanted to get a closer look, you would need the assistance of a **telescope**. A telescope is a device used to magnify distant objects.



There are two types of telescopes: **refractor** and **reflector** telescopes. A refractor telescope uses glass lenses, and a reflector telescope uses mirrors instead of lenses. Each of these telescopes does the same job, but in different ways.

You do not need a very powerful telescope to see great detail in part of the sky. The moon is fun to look at because it is relatively close to Earth, so that it is easier to see. Also, because of the **lunar phases** (phases of the moon) the moon puts on a different show each night. The best time to look at the moon is between the last and first quarter of the lunar cycle. You can see the lunar cycle on many standard calendars.

MAKE A CONNECTION: If you could use a telescope to look into the sky tonight, what would you try to get a closer look at?



You could probably guess that **astronomers** need more powerful telescopes to look into space. The **Hubble Space Telescope (HST)** is our most powerful telescope. It took eight years to build. The Hubble telescope is also a spacecraft. It was designed to **orbit** in space, so that it could get an even better look at the universe. It is about the size of a large tractor trailer truck. It must have power, be able to communicate with Earth and be able to maneuver through space. This allows scientists to direct it from Earth to the objects it wants to see, zoom in and take some incredible photos. The HST was launched in 1990, and it continues to provide us with new and fascinating images today.



Looking Into Space

1. Put a check mark (✓) next to the answer that is most correct.

a) Which of the following is a use of the telescope?

- A orbit the Earth
- B make an image darker
- C make an object appear farther
- D make an object larger

b) Which of the following objects is more like a reflector than a refractor?

- A eyeglasses
- B hand mirror
- C window
- D magnifying glass

c) Which of the following is a good reason to view the moon by telescope?

- A It is relatively close to the Earth.
- B It is never the same view two nights in a row.
- C There are interesting features on the Moon to observe.
- D All of the above.

d) Which of the following facts is NOT true of the Hubble Space Telescope?

- A It is a telescope and a spacecraft.
- B It takes pictures of objects in space from space.
- C It is impossible to communicate with it from Earth.
- D It took eight years to build.

e) Which of the following objects would be of greatest interest to an astronomer?

- A Nebulae
- B Fortune telling
- C Classic cars
- D Chemistry



Looking Into Space

2. Answer each question with a complete sentence.

a) The Hubble Space Telescope is a *reflector* telescope. What does that mean?

b) What is the advantage of launching the HST into orbit?

c) Make a prediction about the next invention that will allow us to look even further into space.

Research & Extension

- The Hubble Space Telescope has taken some incredible photos of objects that we were not even able to see before. Use the internet to research some of these images. Create a slide presentation (using a program like Powerpoint or Corel Presentations) of some of the fascinating photos you find to show your class. The photos you include should focus on newly discovered objects that we were not able to see before. Try to include the distance that each object is from Earth and arrange them from nearest to farthest.
- Oops! Even scientists make mistakes. Since the Hubble Space Telescope was launched in 1990, there have been a number of repairs and improvements made to the HST while in orbit. Research some of these missions and create a timeline of them. You may choose to present this timeline as a poster, complete with photo images.
- Design your own telescope. Research the Hubble Space Telescope to see what it looks like and learn about its major parts and functions. Create your own telescope that improves upon this design. What greater capabilities would your telescope have? Draw a colored and labeled sketch of your telescope and be sure to think of a great name for it. (The HST was named after a scientist named Edward Hubble.) Think of some of the challenges that your design may have. Write a paragraph to describe some of these potential difficulties. Wherever possible, pose a possible solution.



WEB CONNECTION

Check out tonight's sky at: <http://hubblesite.org>
Learn more about the Hubble telescope at: <http://hubble.nasa.gov>



Build It!

MAKE A ROVER

Steps

- STEP ONE:** Design your own rover that you might take to explore another planet. Sketch it out with as much detail as possible.
- STEP TWO:** Plan what types of materials you could use to build a model of your rover.
- STEP THREE:** Collect the needed supplies and assemble the rover.
- STEP FOUR:** Consider what could be used as a model of the planet. (balloon, beach ball, etc.)
- STEP FIVE:** Plan an oral presentation of your rover for your class.

DETAILED SKETCH OF MY ROVER



Word Search

Find all of the words in the Word Search. Words are written horizontally, vertically, diagonally, and some are even written backwards.

- | | | | | |
|--------------|----------------|-------------|------------|---------------|
| astronauts | module | mission | rover | exploration |
| spacecraft | weightlessness | lander | future | reflector |
| microgravity | orbiter | experiments | refractor | space station |
| aeronautics | laboratories | telescope | satellites | launch |
| flyby | | | | |



Comprehension Quiz

2. Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE. 5
- 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. 10
- 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?

Space Shuttle



