

Observing a Comet

Engage

What do you know about comets?

Watch the video found at

<https://www.youtube.com/shorts/V1Wz0rGEigo>

What do you notice?

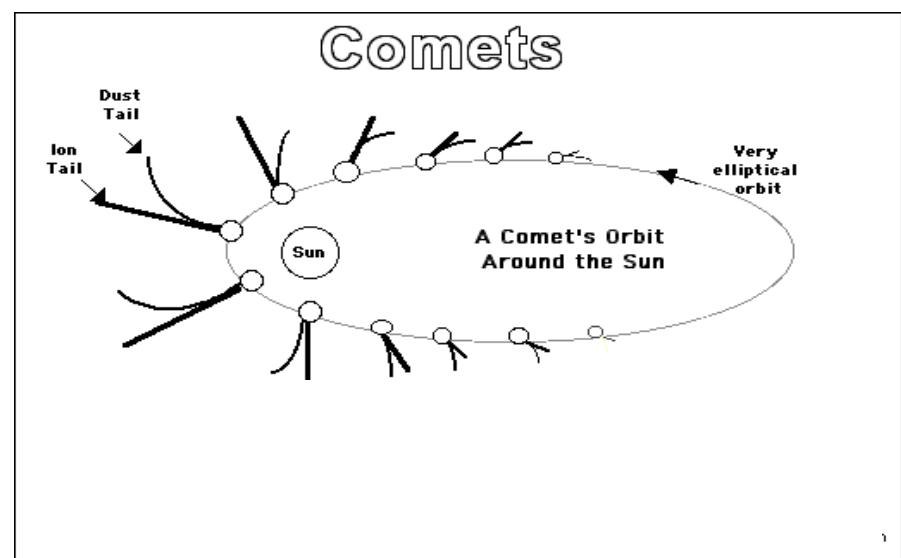
What do you wonder?

Explore

Materials: Styrofoam ball or sheet of copy paper, ribbon or Mylar gift strips, tape, wooden skewer, hairdryer or fan

What To Do:

1. Make a model of a comet using the materials above.
2. If using a sheet of paper make the comet the shape you think your comet nucleus will have.
3. Place the ribbon/Mylar strips on top of the ball or paper nucleus so the two pieces cross each other in an “X” and the lengths of all sides of the strips hang down evenly.
4. Attach the strips to the ball or paper with the tape.
5. Assign a front for your comet and place a letter F on it. On the opposite side place a T for tail.
6. Mount the ball or molded paper on the skewer.
7. Use the hairdryer or fan to simulate the sun’s solar energy as it meets the comet.



Questions:

1. What did you observe about the tail when it was heading to the sun? _____
2. What did you observe about the tail when it was heading away from the sun? _____



Explore page 2

Materials: Famous Comets on the next pages, glue, scissors

What To Do:

1. Cut out the rectangles on the Famous Comets pages along the bold lines. DO NOT cut the dotted lines!
2. Glue the **Comet Shoemaker-Levy 9** to the bottom of your notebook page.
3. Run a line of glue on the BACK of the Anchor Tab on Comet Hyakutake. Line the bottom of the rectangle with the top of the bottom dotted line of Comet Shoemaker-Levy 9.
4. Continue until you have all Famous Comets glued in.
5. Answer the following questions.

Questions:

1. Why was Comet Hale-Bopp so bright?

2. How did Comet Hale-Bopp get its name?

3. Who was Comet Halley named for?

4. When will Comet Halley return to the inner Solar System?

5. When was Comet Swift-Tuttle first seen?

6. How far away from Earth will it be when it next passes by?

7. How was Comet Hyakutake discovered?

8. How long is Comet Hayakutake's orbit?

9. Who discovered Comet Shoemaker-Levy 9?

10. What "first" was recorded with this comet?

Famous Comets

On July 23, 1995, an unusually large and bright comet was seen outside of Jupiter's orbit by Alan Hale of New Mexico and Thomas Bopp of Arizona. Careful analysis of Hubble Space Telescope images suggested that its intense brightness was due to its exceptionally large size. While the nuclei of most comets are about 1.6 to 3.2 km (1 to 2 miles) across, Hale-Bopp's was estimated to be 40 km (25 miles) across. It was visible even through bright city skies, and may have been the most viewed comet in recorded history. Comet Hale-Bopp holds the record for the longest period of naked-eye visibility: an astonishing 19 months. It will not appear again for another 2,400 years.

COMET HALE-BOPP



Comet Hale-Bopp

Anchor Tab

COMET SWIFT-TUTTLE 1992



This comet was first seen in July 1862 by American astronomers Lewis Swift and Horace Tuttle. As Comet Swift-Tuttle moves closer to the Sun every 120 years, it leaves behind a trail of dust debris that provides the ingredients for a spectacular fireworks display seen in July and August. As Earth passes through the remnants of this dust tail, we can see on a clear night the Perseid meteor shower. Comet Swift-Tuttle is noted as the comet some scientists predicted could one day collide with Earth because the two orbits closely intercept each other. The latest calculations show that it will pass a comfortable 24 million km (15 million miles) from Earth on its next trip to the inner Solar System.

Comet Swift-Tuttle

Anchor Tab

On January 30, 1996, Yuji Hyakutake (pronounced "hyah-koo-tah-kay"), an amateur astronomer from southern Japan, discovered a new comet using a pair of binoculars. In the spring of that year, this small, bright comet with a nucleus of 1.6 to 3.2 km (1 to 2 miles) made a close flyby of Earth — sporting one of the longest tails ever observed. The Hubble Space Telescope studied the nucleus of this comet in great detail. This is not Comet Hyakutake's first visit to the inner Solar System. Astronomers have calculated its orbit and believe it was here about 8,000 years ago. Its orbit will not bring it near the Sun again for about 14,000 years.

COMET HYAKUTAKE



Comet Hyakutake

Anchor Tab

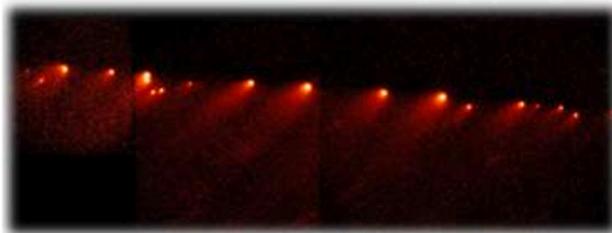
Comet Halley is perhaps the most famous comet in history. It was named after British astronomer Edmund Halley, who calculated its orbit. He determined that the comets seen in 1531 and 1607 were the same objects that followed a 76-year orbit. Unfortunately, Halley died in 1742, never living to see his prediction come true when the comet returned on Christmas Eve in 1758. Each time this comet's orbit approaches the Sun, its 15-km (9-mile) nucleus sheds about 6 m (7 yards) of ice and rock into space. This debris forms an orbiting trail that, when falling to Earth, is called the Orionids meteor shower. Comet Halley will return to the inner Solar System in the year 2061.

COMET HALLEY



Comet Halley

COMET SHOEMAKER-LEVY 9



Between July 16 and July 22, 1994, more than 20 fragments of Comet Shoemaker-Levy 9 collided with the planet Jupiter. Astronomers Carolyn and Eugene Shoemaker and David Levy discovered the comet in 1993. The Hubble Space Telescope took many spectacular pictures of this event as the comet's pieces crashed into Jupiter's southern hemisphere. It was the first collision of two Solar System bodies ever to be recorded. The impacts created atmospheric plumes many thousands of kilometers high that showed hot "bubbles" of gas with large dark "scars" covering the planet's sky.

Comet Shoemaker-Levy 9

ALL ABOUT COMETS

Explain



PHYSICAL PROPERTIES

LOCATION

MOVEMENT

Elaborate

1. Watch the video “Why Study Comets” from <https://houstonpbs.pbslearningmedia.org/resource/npls12.sci.ess.eiu.whycosets/why-study-comets/>
2. Use the Word Bank to help you fill in the blanks below.

WORD BANK					
comets	water	Pluto	gases	coma	
icy	boil	materials	tail	frozen	

1. One of the ways we can learn about the history of our solar system is by studying _____.
2. A comet is an _____, small body.
3. They contain mostly _____ ice.
4. When the comet gets close to the Sun, the ice gets warmed up and starts to _____ off.
5. Many comets have been far beyond _____.
6. If we study comets we can learn about all of the _____ that were there with the solar system formed.
7. Comets are made of frozen _____, ice, dust, and rock.
8. When the comet is far away from the sun everything stays _____.
9. When it gets closer to the Sun, it warms up, creating a _____.
10. As it gets even closer to the sun, the Sun’s radiation pushes some of the coma away from the comet creating the _____.

ALL ABOUT COMETS

G U O N A Q B P H H G V X P M
M A B Q W T J Y W A D M U M I
O J S U K A J S P J D G K J J
O F R E H I C R E E S H T B C
S E I W S L H J L O G F O K P
U K V C C X S F I K H J C C S
F F R O Z E N F H M S O T S O
R X M F C M L A T M R J M Y R
F E Y X Q A L C S M O W F Z U
T W T R V L H J U Z A A E R U
D U B A E N H D D I D E C I P
R K H Y W B S B I O L O E M J
W A M P S M Y K I H R Z Q B X
O M O C E J D T R W N R L G Y
C Z A K K G U S M R M P F C A

comet	ice	water
dust	rock	frozen
como	gases	tail
Halley		

Evaluate

Name _____ period _____

EXIT TICKET

Observing a Comet

1. What is the movement of comets?
 - A. They stay close to the sun
 - B. They orbit the Sun from the Kuiper Belt and Oort Cloud
 - C. They leave Jupiter and move toward Saturn
 - D. They leave the Earth and move toward the rest of the galaxy
2. When do comets form their tail?
 - A. When they get close to the sun.
 - B. When they get far away from the sun
 - C. When they get close to a planet.
 - D. When they get close to an asteroid
3. Which of the following can be found in a comet?
 - A. gas and dust
 - B. liquid water and metal
 - C. living things and dust
 - D. liquid water and living things
4. Comets can tell us about –
 - A. Aliens outside the solar system
 - B. The formation of the solar system
 - C. The composition of the Sun
 - D. How many planets are in the solar system
5. Where do comets come from?
 - A. the asteroid belt and Jupiter
 - B. Mercury and Venus
 - C. The Kuiper Belt and the Oort Cloud
 - D. Pluto and its moon