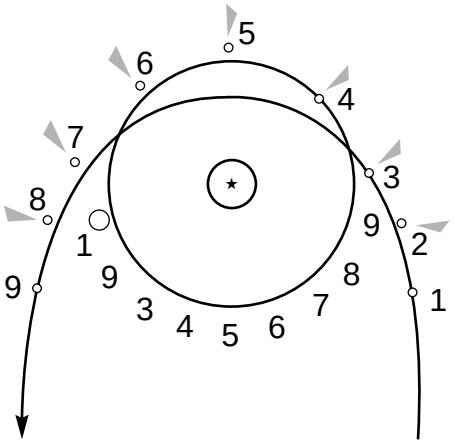
View of a Comet from Earth

Activity: viewing a comet from Earth

Materials: transparency of View of a Comet from Earth (page 50), awl, round-headed metal snap fastener, clear tape, overhead projector, wet-erase pens for transparencies, drawing paper

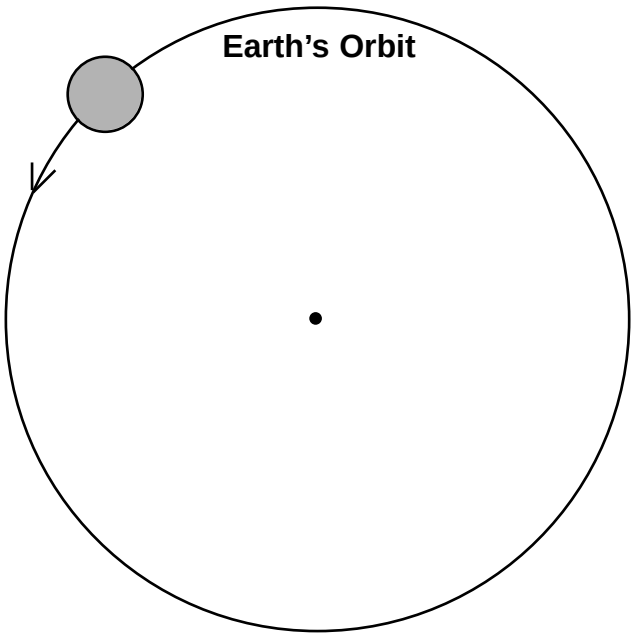


- Follow the instructions to assemble the transparencies of the orbits of Earth and a comet. It should look like the drawing (right) when fully assembled.
- Place this on an overhead projector and have students look at the comet in the various locations of its orbit around the sun. Discuss what they see happening to the comet from positions 1-9. (The tail forms and lengthens as it nears the sun, and then diminishes as it moves away from the sun. The tail always points away from the sun.)
- Rotate Earth's orbit disk until the planet is at the #1 position. Draw a line with a wet-erase pen from Earth to the comet in the #1 position and another from Earth to the sun. Have students tell what the comet would look like from Earth at this time. (*There is no tail; since the comet is far from the Earth, it would appear very dim and small.*) Ask them where it would appear in the sky relative to the sun. (*It would be about 45° from the sun.*) Erase the lines.
- Move Earth to #2 and draw the lines again. Distribute drawing paper to students and have them draw what the comet would look like from Earth, showing the comet and the sun. (*The comet would have a short tail, difficult to see since Earth's view would be nearly straight at the coma. The comet would be somewhat closer to the sun.*)
- Move Earth to #3 and have the students add the new picture of the comet to their drawing. (*The comet's tail will be longer, and it will be closer to the sun.*)
- Continue moving Earth to each position and have students make drawings to show what they would see. (*The comet would disappear in the glare of the sun at #5.*)
- Add the dates to the comet positions on the transparency and have the students place them on their drawings as well, beginning at #2.

  (1) May 15, (2) July 1, (3) August 1, (4) August 25, (5) September 1, (6) September 8,

  (7) October 2, (8) November 1, (9) December 18
- Ask students to look at the comet's motion and explain it. (*The comet moves slowly from #1 to #3, speeds up between #4 and #6, and then slows down again. As the comet is pulled toward the sun, it slowly adds speed and then moves fastest when close to the sun, slowing down again, once it begins to travel away from the sun.*)
- Place an X on one of the places where the comet crosses through Earth's orbit. Explain that a comet's orbit is usually not in the same plane as Earth's orbit but may come in at an angle so that it actually crosses the orbit at only one point. Ask students what happens to the comet as its core heats up when it gets close to the sun. (*It loses dirt from its core.*)
- Explain that this dirt becomes trapped in Earth's orbit here. Rotate Earth to that spot and ask what happens when Earth returns to this part of its orbit again. (*Earth's gravity pulls some pieces into its atmosphere. We see these as meteors.*)
- *The Visual Dictionary of the Universe* (page 56) and *The Young Astronomer* (page 39) have lists of some of the famous comets and their periods (length of time for one trip around the sun). Show the students that some of these will be visible in their lifetime; however, remind them that there will also be new comets appearing as well.

View of a Comet from Earth *(cont.)*



Assembly Instructions

1. Cut along the dotted line below.
2. Cut around Earth's orbit, being sure to leave the Earth and orbit outline.
3. Superimpose the dots in the centers of the sun and Earth's orbit. Use tape to hold the two images together in this position.
4. Place the transparencies over the hole of a tape dispenser, so the dots are in the center of the hole.
5. Push the awl through the dots to make a hole large enough to insert the snap. Be sure there is enough clearance so that Earth's circle can be turned freely around the sun.

Cut along this dotted line.