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<i>The Young Astronomer</i> by Harry Ford (Dorling Kindersley Publishing, Inc., 1998) (available from Penguin Books, CAN; Dorling Kindersley, UK; and HarperCollins, A US)	
<i>Guide to Space: A Photographic Journey Through the Universe</i> by Peter Bond (Dorling Kindersley Publishing, Inc., 1999) (available from Penguin Books, CAN; Dorling Kindersley, UK; and HarperCollins, A US)	
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Looking at the Moon *(cont.)*

Activity: simulating the phases of the moon

Materials: clamp-on light fixture, 150-watt clear light bulb, three-inch Styrofoam balls and stir sticks or wood skewers, transparency of The Moon's Phases (page 21)

- Conduct this activity after students have observed and recorded moon phases for two weeks. This background is needed to understand the simulation.
- This activity must be done in a darkened room. Clamp the light high above all heads. Distribute a Styrofoam ball and stick to each person. Have each one push a stick into a ball. Tell them the ball represents the moon, their heads represent Earth, their noses represent where they live on the planet, and the lamp is the sun.
- Darken the room after turning on the bright light. Simulate the new moon by holding a ball in front of you to block out the light. Have the students do this and notice that the side of the moon they see does not reflect the light. This phase is the *new moon*. (This is actually a solar eclipse position, but an explanation will appear later.)
- Have students hold the moon in front of them and slowly turn counterclockwise, watching as the “sun’s” light falls on the moon. Have them stop when they can see light beginning to show on the ball. Explain that this is a crescent moon, seen after a new phase. Notice the crescent is on the right side of the moon.
- Let students continue to turn slowly, looking for the first quarter, gibbous, and finally the full moon. They must raise the ball overhead so the full moon is not lost in their shadow. Ask them where the sun is at this time. (*on the other side of Earth*)
- As they continue to turn, have them notice that the light is now appearing on the left side of the moon and that the phases go in reverse—from gibbous to quarter to crescent. Repeat this and use the transparency of moon phases to review what students have seen with the moon models.

Activity: learning about moon phases on the Net (assessment for phases of the moon)

Materials: Internet access, copies of The Moon's Phases (page 22)

- Let students visit the following Web site to find and record the moon's phase on various dates.

Moon's Phases Through Time

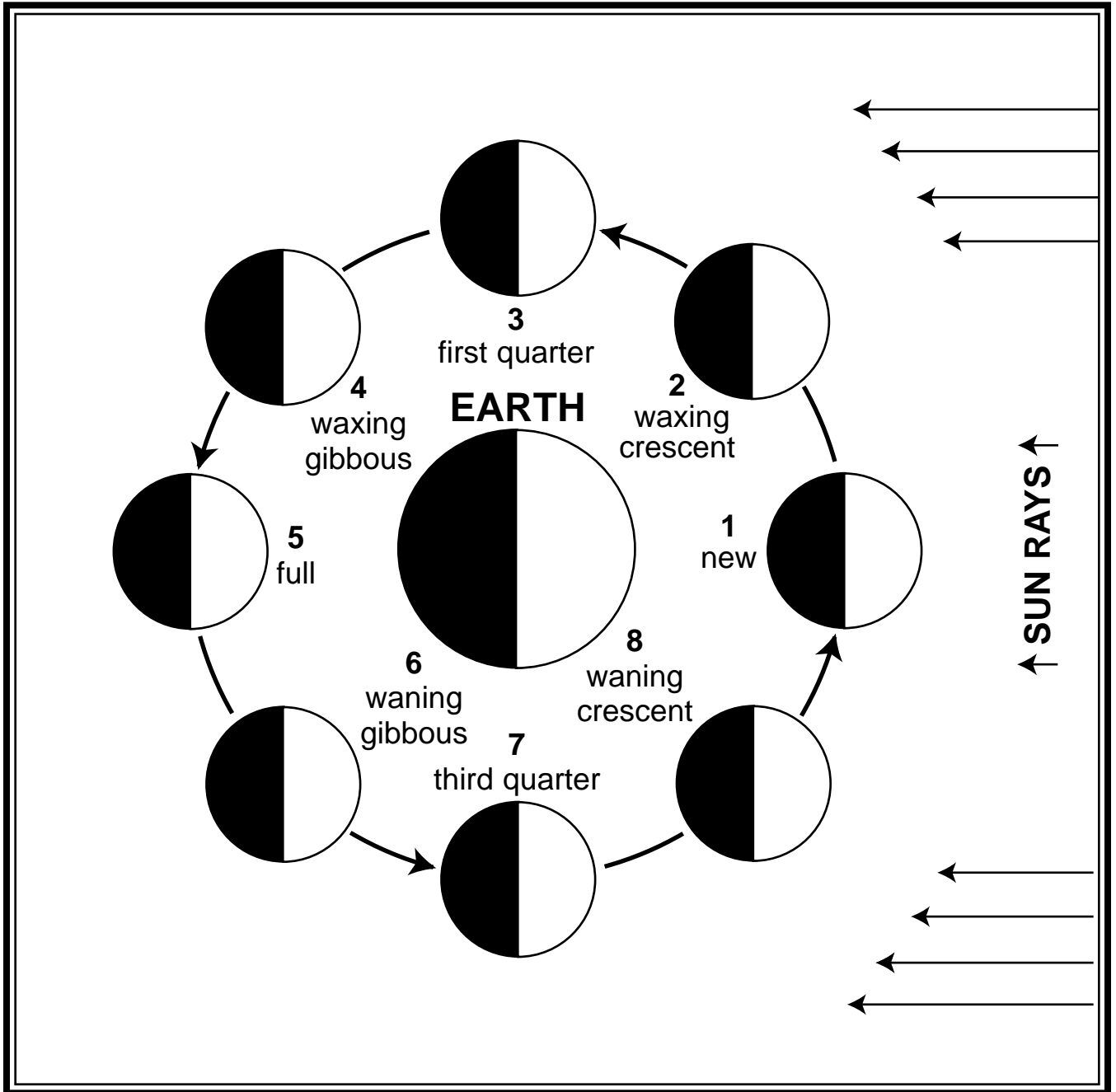
http://www.naturalist.net/Moon_Phases_through_time.htm

- Distribute copies of The Moon's Phases on page 22 to all students and review it with them. Designate times they can visit the Web site to gather their data.
- When all students have completed the assignment, discuss their findings. If needed, help students to answer the question regarding Earth's phase on July 20, 1969. Use the transparency of The Moon's Phases to illustrate this concept.
 1. When looking at Earth from the moon, the phase of Earth would be the opposite of the phase we see of the moon from Earth. For example, if we see a new moon from Earth, Earth itself would be in full phase as seen from the moon.
 2. The moon was a waxing crescent on July 20, 1969. The astronauts would have seen Earth as a waning gibbous. Visit the Web site below and put in the date July 20, 1969. Submit this to see the waning gibbous Earth as it would have appeared to astronauts from the moon.

Solar System Simulator <http://space.jpl.nasa.gov/>

The Moon's Phases

Compare the phases of the moon on this chart with those you saw in the simulation.



Moon as Seen from Earth

