

**Lesson Topic:** Planet Earth

**Objective:**

Students will be able to:

1. Identify the order of the planets.
2. Describe characteristics of the inner and outer planets.
3. Determine the unique qualities of planet Earth.

**Time Required:** 90 minutes

**Materials Needed:**

- Small ball (can be any small object)
- Teacher computer with internet access
- Projector/Smartboard
- 1 computer/laptop/iPad per student with internet access
- Planet Earth handout (attached)
- Ruler (1 per pair)
- Glue (1 per pair)
- Variety of candies to represent planets (teacher discretion, the following is a suggestive list)
  - M&Ms
  - Mini M&Ms
  - Snow caps
  - Butterscotch candies
  - Lifesavers
  - Nerds
  - Sprinkles
  - Skittles
  - Jaw breakers
  - Lemonheads
  - Red hots
  - Dots
- Ziplock bags

**Teacher Preparation:**

- Assign a Legends of Learning Content Review [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
  - Content Review - Middle School - Planet Earth
- Make copies of Planet Earth Worksheet (1 per student)
- Check out reliable resources:
  - <https://www.nasa.gov/topics/earth/index.html>
  - <https://spaceweather.com/>
  - <https://www.space.com/>
  - <http://kids.alma.cl/>
  - <https://amazing-space.stsci.edu/>

**Engage (10 minutes):**

1. Choose a volunteer.
2. Give the student a small ball (any small object will work).
  - a. Tell the student to pass the ball around himself in front and behind his body.
3. Then, tell the student to keep passing the ball around himself while he walks around a large object (desk, table, etc).
  - a. If the volunteer is up to it, have the student continue to pass the ball around himself, walk around the object AND slowly spin in a circle while doing it!
    - i. If the spinning is too much for the space you have in the classroom or too much for students to stay safe, don't do step 3a and discuss it later on in the lesson.
4. Ask students "What did our volunteer just demonstrate for us?"
  - a. Give students time to discuss briefly.
5. Tell students "Yes! Our volunteer was the Earth orbiting the Sun (the desk/table)."
  - a. What was the ball representing? (the Moon orbiting Earth).
6. Tell students "The Earth is just one of the 8 planets in our Solar System that orbit the Sun. We will continue to talk about Earth and our Solar System today."

**Explore (15 minutes):**

1. On the board, briefly draw the following sketch
  - a. (do the best you can, but don't spend too much time on details):



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2. Tell students "These are the planets of our Solar System and this (point to the Sun) is our Sun. In groups, you will be researching one of the planets today just to get an overview of one of the planets."
  - a. I think it would be a good idea to jot down some notes in your notebook as you research.
  - b. Also, be sure you are using reliable sources as well."
    - i. Provide students with a few reliable sources to get them started (listed above).
3. Tell students, "When you feel like you have a good grasp of your planet, send a member of your group to the board and label your planet as well as two facts about it.
4. Put students in groups and assign them a planet of the Solar System.
5. Give students time to briefly research and write their information on the board.
6. When all groups have written some information on the board, start with Mercury and have each group read what they wrote on the board.

**Explain (25 minutes):**

1. Pass out the Planet Earth handout.
2. Tell students “Go ahead and label the Solar System from the sketch on the board.”
3. Tell students “The Solar System is broken into 2 groups: the inner planets and the outer planets.
  - a. Draw a circle around the inner planets and then another circle around the outer planets.
    - i. Have students draw the inner and outer planet circles and label them on their handout.
  - b. Inner Planet Characteristics - mainly made of rock, surfaces are solid, they don't have rings, few or no moons, and are relatively small.
  - c. Outer Planet Characteristics - multiple moons, no solid surface, support rings and are extremely large in size
    - i. Gas Giants = Jupiter and Saturn - mainly made of helium and hydrogen
    - ii. Ice Giants - Uranus and Neptune - rock, ice and mixture of water, methane, and ammonia”
4. Tells students “Let's talk about our planet, Earth, for a moment. It is pretty special. In fact, it is the only known environment in the universe that can sustain life.
  - a. Take a moment to talk to the person next to you and discuss what makes Earth so unique.”
  - b. Give students time to discuss and share out.
5. Tell students:
  - a. “Earth is in the perfect position from the Sun. Any closer and we'd be too hot, and any further away and we'd be too cold. We are the perfect distance to have liquid water.
  - b. Earth is a rocky planet, so we have the ability to support larger life forms like humans, animals, and plants.
  - c. Earth is the perfect size to support the perfect amount of gravity to have a stable environment.
  - d. It orbits the Sun in 365  $\frac{1}{4}$  days, and rotates around itself once every 24 hours.
    - i. It has one moon that revolves around it that takes about 28 days to go around one time.”

**Elaborate (30 minutes):**

1. Have students get into pairs.
2. Tell students, “You will be using the chart at the end of the handout to construct a scaled model of the Solar System. You will use different candies to represent the different planets, but you must make sure to measure it to scale as best you can.”
3. Give each pair a piece of white butcher paper, or a piece of paper at least 16 inches long.
4. Together, have each pair label the Sun on the far right side of the paper. From there, they will be making their measurements.
5. Have a variety of sizes and colors of candy to choose from and allow each pair to choose their candies (if time is an issue you can have the candy already pre-bagged and ready to hand to students. They can choose which candy is which planet).
6. Make sure each pair has a ruler and some glue to glue on the candy in the appropriate place.

7. Give students time to do their calculations and glue on their candy.
8. If time allows at the end, let students share their Solar Systems with the class.

**Evaluate (10 minutes):**

1. Have your students [sign in to Legends of Learning](#). Instruct students to complete the Content Review playlist.
2. [Analyze student results](#) to determine what concepts need to be a focus for reteaching.

**Additional Lesson Strategies:**

- To use Legends for additional instruction, create a [custom playlist](#) with an [instructional game](#) and pre and post [assessment](#).
- To use Legends for a quick formative assessment, create a 5-question [assessment](#) in a [playlist](#).
- To use Legends for a student-directed experience, create a [targeted freeplay](#) playlist.
- Encourage students to play on their own at home in [Legends of Learning: Awakening](#) for a student-driven experience including avatars, battling, and quests all centered around topics they are covering in class.

Name: \_\_\_\_\_

## Planet Earth

Label the names of the planets of the Solar System.



Fill in the table below.

Inner Planet Characteristics	Outer Planet Characteristics	
	<b>Gas Giants</b>	<b>Ice Giants</b>

1. What are Earth's unique qualities?

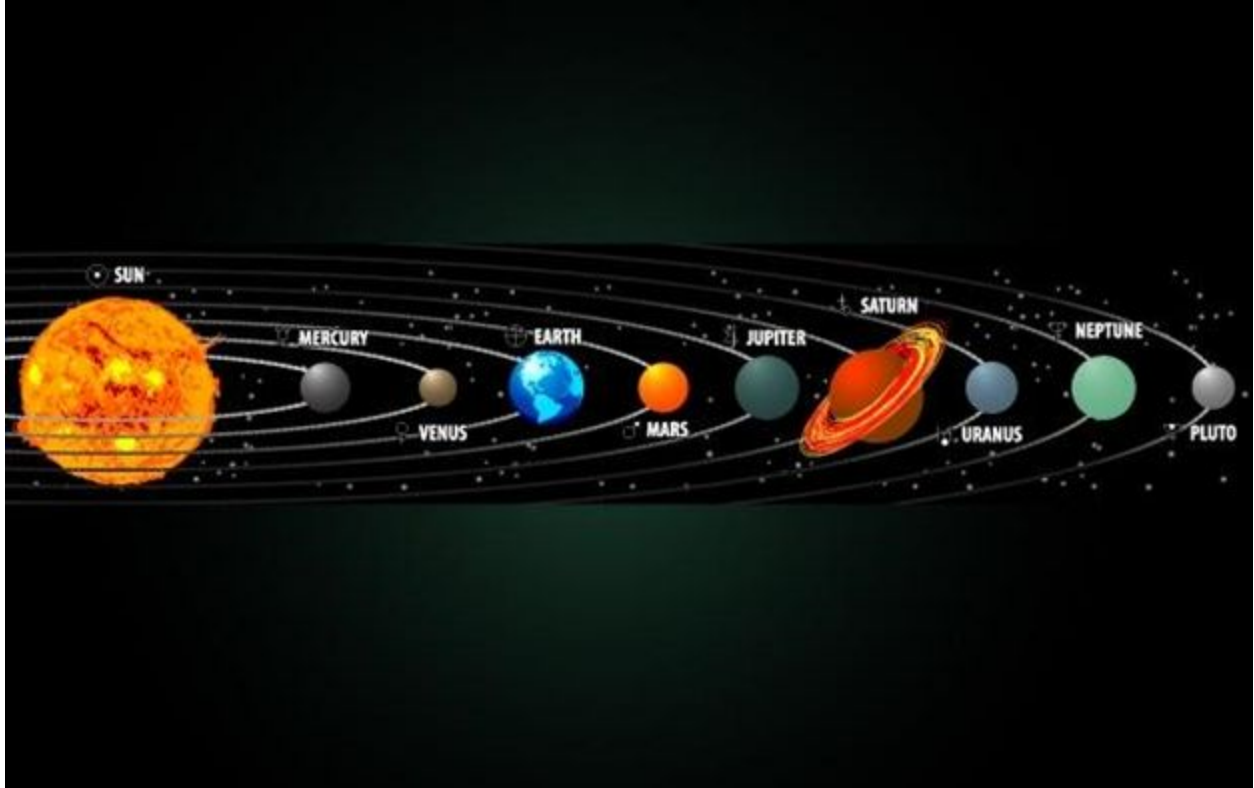
Use the following chart to calculate the distances for your scaled model.

	<b>Scaled Distance from the Sun (reduced by a factor of 100 million)</b>	<b>Distance on scaled model 1 mile = ½ inch</b>	<b>Type of candy used</b>
Mercury	0.4 miles		
Venus	0.7 miles		
Earth	0.9 miles		
Mars	1.4 miles		
Jupiter	4.8 miles		
Saturn	8.8 miles		
Uranus	17.6 miles		
Neptune	27.6 miles		

Name: KEY

## Planet Earth

Label the names of the planets of the Solar System.



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Fill in the table below.

Inner Planet Characteristics	Outer Planet Characteristics					
<ul style="list-style-type: none"> <li>mainly made of rock</li> <li>surfaces are solid</li> <li>they don't have rings</li> <li>few or no moons, and are relatively small.</li> </ul>	<ul style="list-style-type: none"> <li>multiple moons</li> <li>no solid surface</li> <li>support rings</li> <li>extremely large in size               <ul style="list-style-type: none"> <li>e. Gas Giants =</li> <li>f. Ice Giants - Uranus and Neptune -</li> </ul> </li> </ul> <table border="1" data-bbox="824 1024 1382 1461"> <thead> <tr> <th data-bbox="824 1024 1101 1092">Gas Giants</th> <th data-bbox="1101 1024 1382 1092">Ice Giants</th> </tr> </thead> <tbody> <tr> <td data-bbox="824 1092 1101 1461">           Jupiter and Saturn             mainly made of helium and hydrogen         </td> <td data-bbox="1101 1092 1382 1461">           Uranus and Neptune             Made of rock, ice and mixture of water, methane, and ammonia         </td> </tr> </tbody> </table>		Gas Giants	Ice Giants	Jupiter and Saturn  mainly made of helium and hydrogen	Uranus and Neptune  Made of rock, ice and mixture of water, methane, and ammonia
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## 2. What are Earth's unique qualities?

- "Earth is in the perfect position from the Sun. Any closer and we'd be too hot, and any further away and we'd be too cold. We are the perfect distance to have liquid water.
- Earth is a rocky planet, so we have the ability to support larger life forms like humans, animals, and plants.
- Earth is the perfect size to support the perfect amount of gravity to have a stable environment.

- It orbits the Sun in 365  $\frac{1}{4}$  days, and rotates around itself once every 24 hours.
  - i. It is one moon that revolves around it that takes about 30 days to go around one time.

Use the following chart to calculate the distances for your scaled model.

	<b>Scaled Distance from the Sun (reduced by a factor of 100 million)</b>	<b>Distance on scaled model 1 mile = <math>\frac{1}{2}</math> inch</b>	<b>Type of candy used</b>
Mercury	0.4 miles	Approx: $\frac{1}{8}$ inch	Answers will vary
Venus	0.7 miles	Approx: $\frac{1}{4}$ inch	Answers will vary
Earth	0.9 miles	Approx: $\frac{1}{2}$ inch	Answers will vary
Mars	1.4 miles	Approx: 1 inch	Answers will vary
Jupiter	4.8 miles	Approx: 2.4 inches	Answers will vary
Saturn	8.8 miles	Approx: 4.4 inches	Answers will vary
Uranus	17.6 miles	Approx: 8.8 inches	Answers will vary
Neptune	27.6 miles	Approx: 13.8 inches	Answers will vary