

Lesson Topic: Earth's Atmosphere

Objective:

Students will be able to:

1. Identify the layers of Earth's atmosphere.
2. Describe the heights, temperatures and pressures of each layer of the atmosphere.
3. Identify the gases present in each layer of the atmosphere.
4. Present information about one of the layers of Earth's atmosphere.

Time Required: 85 minutes

Materials Needed:

- Teacher computer with internet access
- Projector/Smartboard
- 1 computer/laptop/iPad per student with internet access
- Earth's Atmosphere handout (attached)
- Atmosphere Video: [The Earth's Atmosphere: Up and beyond the sky | Educational Videos for kids](#)
- White paper (1 per group)
- Coloring utensils

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 - Earth's Atmosphere
- Make copies of Earth's Atmosphere Worksheet (1 per student)

Engage (10 minutes):

1. On the board, write the following words: onion, cake, atmosphere, soil, jackets.
2. Tell students "With the person sitting next to you, discuss what all of these words have in common."
3. Give students time to discuss, then listen to what they came up with.
 - a. Tell students, "They all have layers! Today we are going to talk about the atmosphere and what is happening in each of its layers."
 - b. Ask students "What is the atmosphere?" (gases that surround the Earth held in place by gravity).
 - i. Write the definition on the board.

Explore (15 minutes):

1. Have students get out a piece of paper.
2. Tell students "We are going to watch a brief video. While you watch, write down each layer of the atmosphere and at least one fact about each layer."
3. Play the [video](#).
4. Have students get into pairs.
5. Using their notes to help them, have students create the layers of the atmosphere.
 - a. Between the two of them, have them stack 5 of their notebooks, folders, books,

- etc on top of one another.
- b. Have them explain to their partner what each book/item represents which layer of the atmosphere.
6. Give students a chance to build their stack of layers.
 7. Then, choose a couple volunteers to share their stack and explain each layer of “their atmosphere.”
 - a. Be sure to correct students if they do not layer their atmosphere correctly, but reassure them there will be much more practicing throughout the lesson to get it right.

Explain (25 minutes):

1. Pass out the Earth’s Atmosphere handout.
2. Tell students “As we have already learned, the atmosphere is made up of 5 layers.”
 - a. Ask students “what are the five layers, starting from the Earth’s surface?” (troposphere, stratosphere, mesosphere, thermosphere, exosphere).
 - b. Let’s write these terms in our handout (write them on the board so students can copy them down).
3. Layers of the atmosphere:
 - a. Troposphere - closest layer to the Earth’s surface, 0-12 km in height. This is where our weather and climate takes place, because almost all of the atmosphere’s water is found in this layer.
 - b. Stratosphere - second layer, 12-70 km in height. The ozone layer is found here that filters the Sun’s UV rays to allow life to survive on Earth. Jets fly in this layer to help to avoid turbulence of weather.
 - c. Mesosphere (middle) - third layer, 50-80 km in height. Coldest layer in the atmosphere with extreme temperatures as low as -90°C .
 - d. Thermosphere - fourth layer, 80-400 km in height. Space shuttles travel around the earth and the northern lights are seen.
 - i. Write the following gases on the right side of the illustration. They are found in the first four layers of the atmosphere: atomic oxygen, molecular oxygen, atomic nitrogen, molecular nitrogen, helium, and hydrogen.
 - e. Exosphere - final layer, 400-2000 km in height. It is the barrier between Earth’s atmosphere and the emptiness of space.
 - i. Write in the following gases on the right side of the illustration: hydrogen, helium, carbon dioxide, and atomic oxygen.
4. Tell students “Take a look at the graph in your handout. This illustrates the layers of the atmosphere as well as the temperatures, height, and pressures at each layer.”
 - a. Using this graph, try and answer these questions with a partner.
5. Give students time to work, then go through the answers together as a class (key attached).

Elaborate (25 minutes):

1. Put students into groups.
2. Assign each group one of the layers of the atmosphere.
3. Each group needs to come up with a 30 second commercial about their layer of the atmosphere, trying to persuade someone to visit their layer.

4. Their commercial must include:
 - a. Accurate information about their layer
 - b. A catchy slogan about their layer.
 - c. A visual aid to enhance their commercial.
5. Give all groups one piece of paper to use as their visual aid
 - a. They can use the paper however they want (drawing a picture, writing their slogan on it, writing the name of their layer etc).
6. Give students time to brainstorm ideas and practice their pitch.
7. Then, each group can perform their commercial for the class.
8. ****After the groups are finished, you can use the visual aids to display on the wall or in a particular place in the classroom as a reminder of the layers of the atmosphere.****

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: _____

Earth's Atmosphere

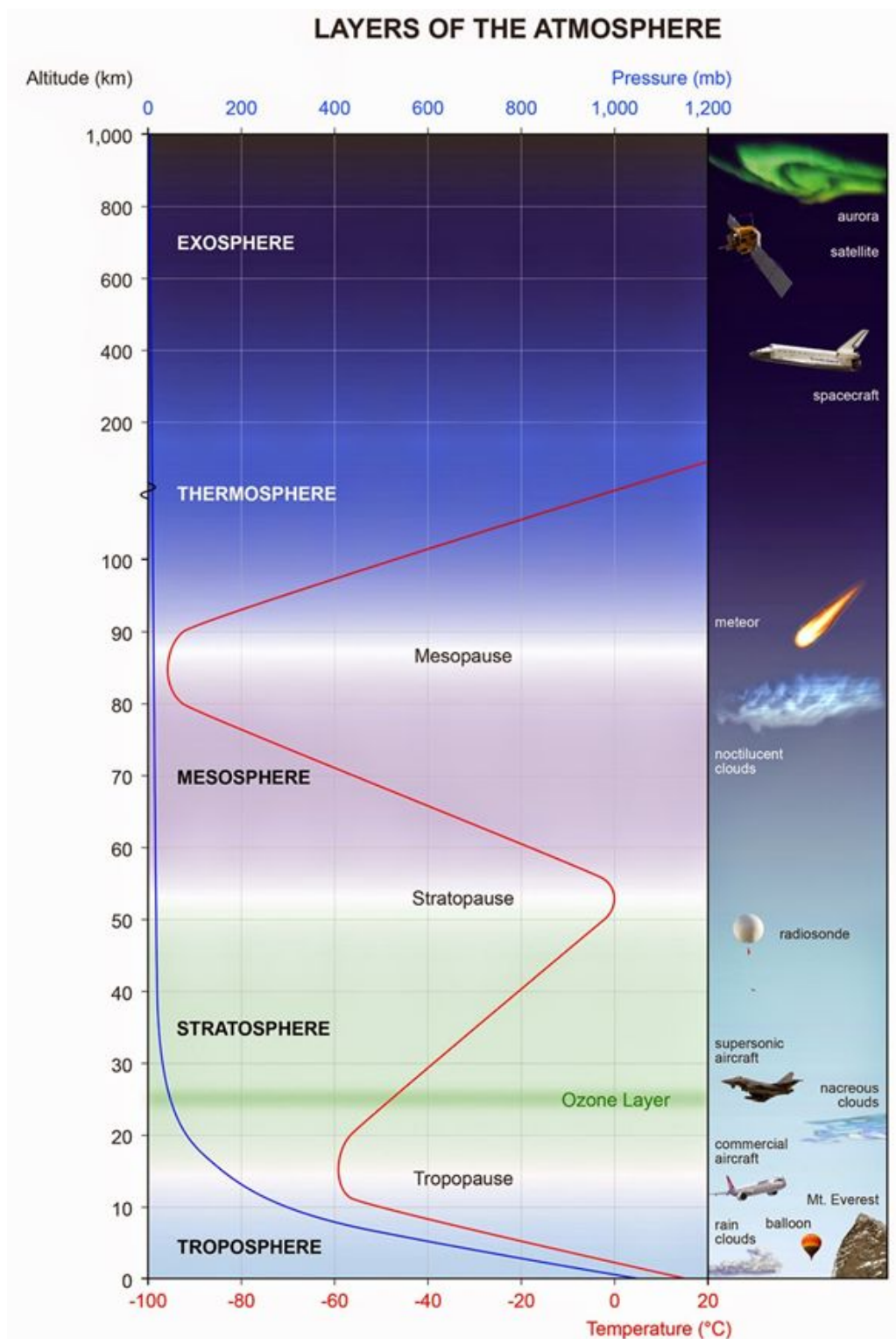
Label the following diagram with the layers of the atmosphere and their definitions.



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Temperatures, Heights, and Pressures of the Atmosphere

Look at the graph below to answer the questions.



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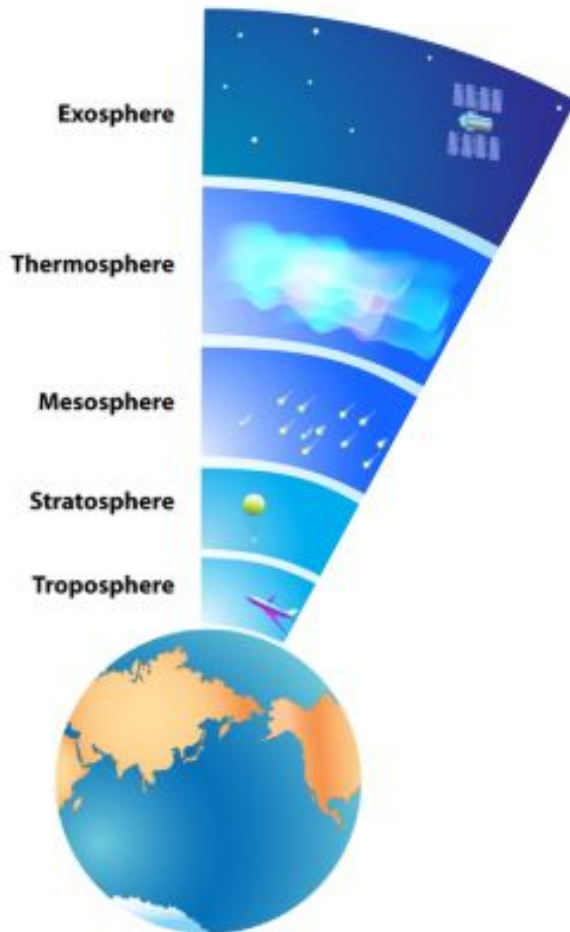


1. Describe what happens to the temperature from the Stratosphere to the Mesosphere.
2. In which layer would you find a meteor?
3. As the altitude increases, what happens to the pressure?
4. In terms of temperature and pressure, what can you say about the troposphere?

Name: **KEY**

Earth's Atmosphere

Label the following diagram with the layers of the atmosphere and their definitions



1. Describe what happens to the temperature from the Stratosphere to the Mesosphere. **It increases in the stratosphere and then sharply decreases in the mesosphere.**
5. In which layer would you find a meteor? **Mesosphere**
6. As the altitude increases, what happens to the pressure? **Decreases**
7. In terms of temperature and pressure, what can you say about the troposphere?
The troposphere has the highest temperatures and the highest pressure of all the layers