

EARTH SCIENCE Lesson Plan

Quarter 2, Week 1, Day 1



Outcomes for Today

Standard Focus: Earth Sciences 4.c “*Students know the different atmospheric gases that absorb the Earth’s thermal radiation and the mechanism and significance of the greenhouse effect*”, and 8.a “*Students know the thermal structure and chemical composition of the atmosphere*”.

PREPARE

1. Background knowledge necessary for today’s reading.

Earth’s original atmosphere was likely composed of methane and ammonia. Early Earth was more volcanic, and the atmosphere changed over geologic time as water vapor, chlorine, carbon dioxide, hydrogen and nitrogen. As the surface cooled, the water vapor condensed and filled low basins on the surface to ultimately form the oceans.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today’s reading

ozone water vapor ultraviolet radiation

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 11.1, pp. 271-273

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Air is a combination of many gases.
- The amount of water vapor in the air is constantly changing.
- Dust and salt play a role in cloud formation.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: The Goldilocks Principle: A model for Atmospheric Gases

Procedure: Students build models of the atmospheres of Earth and two other planets for comparison.

Discussion: Discuss the importance of greenhouse gases and the role they play.

Key question: What is the Goldilocks Principle?

Source: [http:// www.ucar.edu/1_1_2_1t.htm](http://www.ucar.edu/1_1_2_1t.htm)

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.

EARTH SCIENCE Lesson Plan

Quarter 2, Week 1, Day 2



Outcomes for Today

Standard Focus: Earth Sciences 8.c “*Students know the location of the ozone layer in the upper atmosphere, its role in absorbing ultraviolet radiation, and the way in which this layer varies both naturally and in response to human activities.*”

PREPARE

1. Background knowledge necessary for today’s reading.

The atmosphere is not a uniform mass of air extending from the Earth’s surface into space. It is divided into several different layers. The layers differ in chemical composition and temperature. Atmospheric pressure decreases with increasing altitude.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today’s reading

Troposphere stratosphere mesosphere thermosphere exosphere

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch.11.1, pp. 273-274

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Most weather takes place in the troposphere, the layer closest to the Earth's surface.
- The stratosphere is made up primarily of concentrated ozone.
- Air temperature varies throughout the atmosphere because of air's chemical composition.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Layers of the Atmosphere

Procedure: Students plot data points and determine where layers begin and end.

Discussion: Discuss the different layers of the atmosphere and their variations.

Key question: What is the basis for dividing the atmosphere into layers?

Source: http://geosociety.org/educate/LessonPlans?Layers_of_Atmoshere.pdf

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.

EARTH SCIENCE Lesson Plan

Quarter 2, Week 1, Day 3



Outcomes for Today

Standard Focus: Earth Sciences 4.a “Students know the relative amount of incoming solar energy compared with Earth’s internal energy and the energy used by society”, 4.b “Students know the fate of incoming solar radiation in terms of reflection, absorption, and photosynthesis”, 5.a “Students know how differential heating of Earth results in circulation patterns in the atmosphere and oceans that globally distribute heat”, and 6.a “Students know weather (in the short run) and climate (in the long run) involve the transfer of energy into and out of the atmosphere”.

PREPARE

1. Background knowledge necessary for today’s reading.

The atmosphere gets all of its energy from the sun. Energy is distributed throughout the atmosphere in three ways.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today’s reading

radiation

conduction

convection

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch.11.1, pp. 275-277

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Only about 50% of incoming solar radiation is absorbed directly or indirectly by the Earth's surface.
- Conduction affects only a very thin atmospheric layer near the Earth's surface.
- Convection currents are responsible for vertical movements of air.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Atmospheric Processes - Radiation

Procedure: Students will investigate how different surfaces absorb heat.

Discussion: Discuss heat transfer in general, and radiation more specifically.

Key question: How would uneven energy absorption by different surfaces on earth affect the atmosphere?

Source: http://www.ucar.edu/learn/1_1_2_5t.htm

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.

EARTH SCIENCE Lesson Plan

Quarter 2, Week 1, Day 4



Outcomes for Today

Standard Focus: Earth Sciences 8.a

PREPARE

1. Background knowledge necessary for today's reading.

Air has many properties. It can absorb and retain heat, move, hold moisture, and exert pressure.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

temperature heat

dew point

condensation

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch.11.2, pp. 278-279

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Heat flows from an object of higher temperature to an object of lower temperature.
- Condensation takes place when matter changes from a gas (water vapor) to a liquid (water).
- Clouds form when water vapor condenses into water droplets.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Dew formation, text p.271

Procedure: Students will model the formation of dew

Discussion: Discuss the role of dew point in forecasting.

Key question: Did the results vary with location?

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.

EARTH SCIENCE Lesson Plan

Quarter 2, Week 1, Day 5



Outcomes for Today

Standard Focus: Earth Sciences 5.c “Students know the origin and effects of temperature inversions”.

PREPARE

1. Background knowledge necessary for today’s reading.

Like water in the ocean, air has mass and constantly exerts pressure on us. In the atmosphere temperature is directly proportional to pressure. The relationship between temperature and density is inversely proportional.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today’s reading

air pressure density temperature inversion

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch.11.2, pp. 280-281

RESPOND

6. Fix the facts. Clarify what’s important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Atmospheric pressure decreases with height because there are fewer gas molecules exerting pressure.
- Air rises when temperature increases.
- A temperature inversion can trap pollution.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Temperature Inversion Lab

Procedure: Students investigate conditions for a temperature inversion.

Discussion: Discuss possible reasons for this to occur.

Key question: What sources of pollution could be trapped by a temperature inversion?

Source: http://www.wmcac.org/documents/educational_packet_6-8.pdf

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.