

Learning Objective: Role of Sunlight and Gravity in the Water Cycle

NGSS Standards:

MS-ESS2.C-2: Global movements of water and its changes in form are propelled by sunlight and gravity.

Objective:

Students will be able to:

1. Explain the role of gravity and sunlight within the water cycle.
2. Illustrate and label an appropriate water cycle diagram.
3. Identify which processes in the water cycle are caused by solar radiation and which are caused by gravity.

Time Required: 60 minutes

Materials Needed:

- 1 computer/laptop/iPad per student with internet access
- 1 teacher computer with internet and projector
- Role of Sunlight and Gravity Handout for each student

Teacher Preparation:

- Create Playlist 1, a 23 minute [playlist](#) in [Legends of Learning](#) using the following game from the Role of Sunlight and Gravity in the Water Cycle Learning Objective:
 - *Water Travelers*
- Create Playlist 2, a 7 minute [playlist](#) in [Legends of Learning](#) using the following game from the Role of Sunlight and Gravity in the Water Cycle Learning Objective:
 - *Water an Infinite Cycle*
- Copy Role of Sunlight and Gravity handout (attached)

Engage (5 mins):

1. Have students start with the following question as a warm-up: “Where does water come from and how does it move around?” Obviously the first part of this is harder for students to address than the latter. Have students do a think-pair-share and then discuss the information.
2. From the discussion, students should understand that water is circulated on our planet. It is stored in living organisms and bodies of water and moved between these using different forces.

Explore (25 minutes):

1. Have your students [sign in to Legends of Learning and enter your teacher code](#).
2. [Launch](#) Playlist 1 to your students.
3. As students complete *Water Travelers*, they should fill out the question portion of the Role of Sunlight and Gravity Handout.

Explain (5 minutes):

1. Bring up the following video for students to watch:

<https://www.youtube.com/watch?v=z5G4NCwWUxY>

Elaborate (15 minutes):

1. Have students create a labelled diagram of the water cycle on their own paper. You can allow them to create their own image and then check it as a class, provide them a blanked out copy with a word bank, or have them copy a diagram from the board/textbook. This depends on the level of your student.
2. Have students label the diagram with different colors to indicate which processes are caused by evaporation and which are caused by gravity.

Evaluate (10 minutes):

1. Have your students [sign in to Legends of Learning and enter your teacher code](#).
2. [Launch](#) Playlist 2 to your students.
3. Use progress on *Water an Infinite Cycle* to assess student understanding the water cycle.
4. Assist students as needed during game play, pause playlist if you need to address content or questions to entire class.



Name: _____ Date: _____

Role of Sunlight and Gravity in the Water Cycle
Content Notes

1. Water changes state when it gains or loses energy. Most of this energy comes from _____.

2. What is the process called as water changes from a solid to a liquid?

3. What property of water changes when water changes state?

4. Put the states of water into order by density from least to greatest.

5. Which two factors power all of the movement of water in and around Earth?

6. _____ provides the energy that drives the water cycle while _____ is the force that keeps the water in the water cycle moving.

7. Gravity pulls denser (_____ or _____) ocean water downward, which pushes less dense (_____ or _____) water upward toward the surface.

8. What is the process called as water changes from a liquid to a gas?

9. Gravity pulls denser air (_____ and/or _____) downward in the atmosphere, which causes less dense air (_____ and/or more _____-) upward, allowing clouds to form through _____.

10. Which stages of the water cycle that require solar radiation?

11. Stages of the water cycle that are driven by the force of gravity?

Diagram

On the back of the paper, draw and label your own version of the water cycle which includes the following processes: precipitation, evaporation, transpiration, condensation, and runoff. Label those processes that are related to radiation in red and those related to gravity in blue.