FRESHWATER
Tool Kit & Resources

# WATER ON THE MOVE

## *The journey of a drop of water in the water cycle.*

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*Students will simulate the paths that water takes in the water cycle.*

**Activity time:**
45 minutes

**Water Words:** Evaporation, condensation, precipitation, transpiration, watershed, glaciers, groundwater, erosion and sedimentation

This lesson was adapted from *Project Wet*.

**Materials -**

- ✓ Glass of water
- ✓ Action steps - strips cut from the Action Steps page
- ✓ Station labels – cut from the Station Labels page
- ✓ Water Drop Score Card and pencil – one for each student
- ✓ 10 small bags or bowls to hold action steps
- ✓ Watch or stop watch

**Game Set-up**

- ♦ Make a copy of the Water Drop Score Card for each student.
- ♦ Cut out 10 station labels and place each one around the room.
- ♦ Cut each strip on the Water Cycle Action Step page and place in a bag and then at the appropriate station.

***Discussion*** *- **Show the students a diagram or video of the water cycle as you discuss the following information.***

Water is constantly moving around the planet. The water on Earth today is approximately the same amount of water that's been here for over 4 5 billion years – the age of planet Earth. There's a good chance that the water in this glass is what thirsty dinosaurs drank about 65 million years ago!

The sun warms water on the surface of lakes, oceans, and rivers and transforms tiny water droplets into vapor that travels up into the sky – this is **evaporation**. The vapor gets cooler as it travels up, turns to liquid and forms clouds – this is **condensation, the opposite of evaporation**. When the liquid gets so heavy it can't stay in the atmosphere anymore, it falls as rain, snow, sleet or hail – this is **precipitation**. This cycle continues over and over every minute of every day and is called the water cycle. Energy from the sun is the driving force that powers the water cycle.

In the coldest regions of Earth, water is stored for a long time as ice and hard-packed snow. Even this ice and snow are in motion. Solid rivers of ice, called **glaciers,** slowly melt as they move forward inch by inch. Some glaciers flow to oceans. Icebergs break away from the glaciers and float in the ocean, slowly melting as they move toward warmer water.

The movement of water is influenced by the contour of the land and geologic features such as mountains, valleys and hills. A **watershed** is an area of land that guides water over the land to small streams towards bigger bodies of water like a stream, river, lake or ocean. Over time or with a big storm event, water's movement in watersheds creates contours on the land. The power of water causes **erosion** which removes dirt from the land and deposits the

dirt somewhere else which is called **sedimentation**. Water drops eventually return to oceans through this drainage system of lakes, streams and rivers.

Some of the **precipitation,** in the form of rain, snow or sleet, seeps into the ground to become **groundwater**. Areas underground that hold this water are called **aquifers**. Groundwater can reach the surface by springs that flow into rivers and lakes. People remove groundwater by digging wells for homes, businesses and irrigations of farmer's fields.

Living things are part of the water cycle too! Plants pull water from the ground by their roots and exhale water through the pores in their leaves as vapor. This is called **transpiration**. Animals, birds and people drink water and eat foods that contain water. They get rid of some water as fluid (pee) or as vapor when we breathe. **It's all connected!**

## *Ok, are you ready to take the journey of a water drop?*

**Play**

- Make sure students understand the terms: evaporation, condensation, precipitation, transpiration and groundwater.
- Use the following questions to get the students thinking:
  1. If every living thing needs water, why doesn't it all get used up?
  2. Where does the water go when puddles dry up?
  3. Why don't lakes and oceans dry up?
  4. Where does rain come from?
- Explain that the water cycle is really the "journey" of water drops and molecules. They are going to become the water drop in this game.
- Hand-out a score card to each student and divide the class into 10 groups of equal size – or fewer groups if needed.
- Send the groups to a different station. Tell them when you say, **"CYCLE"**, they need to go to the next station, rotating around the room.
- Tell 1 student from each group to remove a strip from the station bag/below. They should read it out loud to their group. Everyone should record the station name, what happened and where they need to go next. Make sure the strip goes back in the bag/bowl.
- After a few minutes say **"CYCLE"** to the students so they go to the next station.
- Continue for as long as possible so the students visit as many stations as possible.

**Wrap-up:**

Ask students the following questions:

1. Will we ever run out of water?
2. What was the most interesting thing you learned about the water cycle?
3. Where else can you find water other than in oceans, rivers, lakes and streams?

## Water Cycle Game Station Labels

Cut out these words that will become a separate station label. Place each label in a different spot around the room. A bag of action steps will also be placed at each station.

CLOUD

GLACIER

PLANT

STREAM

FIELD

STREET

GROUND-WATER

GREAT LAKES

ANIMAL

HUMAN

# Water Drop Score Card

Students Name:_____

| | Station Stop | What Happens | Destination |
|---|---|---|---|
| Example | Cloud | Fall as rain | Field |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

Describe your entire journey on the back of this card.

# Water Cycle - Action Steps

Cut the strips below from each station. Place them in the bag for that station.

| CLOUD | GLACIER |
|---|---|
| You fall as rain onto the street. Go to the Street station. | You evaporate into the air. Go to the Cloud station. |
| You fall as snow onto a glacier. Go to the Glacier station. | You're in frozen ice and break off from the shore into Lake Superior. Go to the Great Lakes station. |
| You fall as rain into the stream. Go to the Stream station. | The glacier begins to melt during a hot summer day and flows into a stream. Go to the Stream station. |
| You fall into the mouth of a human who is dancing in the rain. Go to the Human station. | Glaciers begin to melt, and you flow over a field. Go to the Field station. |
| You fall as rain into the field. Go to the Field station. | You get frozen in the ice on a glacier. Stay at the Glacier station. |
| You fall as snow into a Great Lake. Go to the Great Lakes station. | It's a sunny day and the glacier melts on the top. The pool of water starts to evaporate, and the vapor floats up into the sky. Go to the Cloud station. |

| PLANT | STREAM |
|---|---|
| The plant transpires you through its leaves into the air as vapor. Go to the Cloud station. | You evaporate into the air from a stream. Go to the Cloud station. |
| The plant transpires you through its leaves into the air, to a cloud and then falls as rain in a stream. Go to the Stream station. | A plant growing near the banks of the river takes you up through its roots. Go to the Plant station. |
| The plant transpires you on a damp morning and you fall from the leaves onto the field. Go to the Field station. | You continue flowing downhill and become part of Lake Michigan. Go to the Great Lakes station. |
| The plant pulls you from the ground into its roots and uses you to grow. Stay at the Plant station. | An animal comes to the stream and licks you up. Go to the Animal station. |
| The tomato plant stores you in its fruit, which a little girl eats. Go to the Human station. | A lot of rain has forced you over the banks of the stream and you enter the streets. Go to the Street station. |
| The animal eats the plant which you are in. Go to the Animal station. | A boy is swimming in a stream and swallows you. Go to the Human station. |

# Water Cycle - Action Steps

| Groundwater | Great Lakes |
|---|---|
| You become part of an underground stream that flows into Lake Huron. Go to the Great Lakes station. | You evaporate into the air. Go to the Cloud station. |
| A teacher drinks water that is pumped out of the ground from a city well. Go to the Human station. | You are one of the countless water molecules in a Great Lake. Stay at the Great Lakes station. |
| You are in an underground stream that flows to a spring that flows into a stream. Go to the Stream station. | An algae plant takes you in, releases you through its leaves, and transpires you into the air. Go to the Cloud station. |
| A plant near a spring takes you up through its roots. Go to the Plant station. | A beaver in Lake Michigan drinks you. Go to the Animal station. |
| You push up through the earth in a spring and a beaver drinks you. Go to the Animal station. | A hiker on Lake Superior's shores stops for a quick drink. Go to the Human station. |
| You are pumped out of the ground from a well to irrigate a farmer's field. Go to the Field station. | A large rain storm over Lake Erie causes you to overflow into the streets. Go to the Street station. |

| Animal | Human |
|---|---|
| After drinking you, the squirrel pees and you seep into the ground. Go to the Groundwater station. | A teacher is running in a race and is breathing hard. You are exhaled from her lungs into the air. Go to the Cloud station. |
| A fox eats a plant you're in. Go to the Animal station. | A girl is playing soccer on a field nd is hot and sweating. You fall from her forehead onto the field. Go to the Field station. |
| You are exhaled from a bear's lungs into the air. Go to the Cloud station. | The Principal washes her car and you flow into the street. Go to the Street station. |
| A dog was swimming in a small pool and comes out and drips on the street. Go to the Street station. | A person waters their grass and you soak into the ground. Go to the Groundwater station. |
| You're in the muscle of a cow and you're eaten in a burger by a teacher. Go to the Human station. | A person pees in a toilet and flushes you. You go to a treatment plant, are cleaned then sent to Lake Michigan. Go to the Great Lakes station. |
| You're in a bird flying over the Great Lakes that pees. Go to the Great Lakes station. | A person waters their garden and you are absorbed by a plant. Go to the Plant station. |

# Water Cycle - Action Steps

| Field | Street |
|---|---|
| You are in a puddle in a field and evaporate into the air. Go to the Cloud station. | You fall as rain from a cloud into the street and flow onto the grass and seep into the ground. Go to the Groundwater station. |
| You're in stormwater that flows across a field and into a stream. Go to the Stream station. | You evaporate from a pot hole in the street into the air. Go to the Cloud station. |
| After a big rain storm you soak into a farmer's field and become part of the groundwater. Go to the Groundwater station. | You are in a puddle in the street and a thirsty dog licks you up. Go to the Animal station. |
| After the snow melts you soak into the famer's field and get absorbed by a plant. Go to the Plant station. | You fall as snow on the street and are plowed to the street's edge. When you melt, you are absorbed by a plant. Go to the Plant station. |
| You are in an ear of corn on a corn stalk in a farmer's field and a little boy eats you. Go to the Human station. | Someone is washing their car in the street. You flow into a storm drain then into a stream. Go to the Stream station. |
| You are in a puddle in a field of prairie flowers and a mouse drinks you. Go to the Animal station. | You fall as a rain drop into the streets, into a gutter, then out a storm pipe into Lake Michigan. Go to the Great Lakes station. |