A Water Cycle of many paths (Adapted from NSTA Science Scope /January 2015)

1. Draw what a water cycle looks like and label.
2. Travel through a “life” of a water drop.

You will travel through different stations depending on the roll of the dice.

You will make a chart of where you started and after each roll where you go next.

You will follow the directions that pertain to each roll at the station you are at.

Continue rolling until you get back to your original station.

1. **Answer the following questions in groups.** Compare your paper to those of the other individuals in your group.
2. Does each pair have the same number of locations?
3. Are they in the same order?
4. What do you think that means?
5. Did anyone get stuck at one of the stations? For how long? What does that mean in real life?
6. How does this activity challenge the water cycles you drew earlier?
7. Which of the station changes in water’s state of matter does the “Sun” drive?
8. Which of the station changes does gravity “drive” in your cycles?

**Elaborate/Evaluate**

1. Now you will draw a revised water cycle diagram and label. You should make sure you include all 11 stations within your diagram.
2. After labeling the diagram you need to fill out the following chart. This includes what is the process and figuring out the driving force behind the process.
3. Write a brief reflection to the following questions:

How does this model accurately describe the real world?

What are this model’s limitations?

**Extension**: Answer the following question and justify your answer.

1. How can humans impact the the water cycle?

Fill out graph below: Processes and driving forces for water-cycle stages

|  |  |  |  |
| --- | --- | --- | --- |
| Starting Station | Ending station | Process | Driving force |
| Ocean | Air |  |  |
| Air | Cloud |  |  |
| Cloud | Rain |  |  |
| Lake | Air |  |  |
| Lake | Animal/human | Drinking |  |
| Animal | Air |  |  |
| Animal  | Ground |  | Gravity |
| Ground | Groundwater |  |  |
| Ground | Plant |  |  |
| Ground | Air |  |  |
| Ground | Lake |  |  |
| Groundwater | Humans | Wells, pumping |  |
| Humans | Humans |  |  |
| Human  | Air |  |  |
| Human | Lake |  |  |
| Human | Groundwater |  |  |
| Plant | Animal/human |  |  |
| Plant | Air |  | Sun |

Directions for the stations:

|  |  |
| --- | --- |
| Dark Blue Station: Ocean | 1,2,3: You evaporate and go into the air, (Go to Yellow Station)4,5,6: You remain part of the ocean |
| Yellow Station: The air | 1, 2, 3: You condense (turn into liquid) and become a part of a cloud. (Go to White Station)4,5,6: You remain water vapor in the air |
| White Station: Cloud | 1,2: You remain in the cloud3,4: You fall as rain onto the ground, (Go to Green Station)5: You fall as rain into a lake. (Go to Light Blue Station)6: You fall as rain into the ocean. (Go to Dark Blue Station) |
| Light Blue Station: Lake | 1, 2: You evaporate and become part of the air. (Go to Yellow Station)3, 4: An animal drinks you. (Go to Orange Station)5, 6: Humans process you into drinking water. (Go to Black Station) |
| Orange Station: Animal | 1, 2: The animal exhales you into the air as vapor. (Go to Yellow Station)3, 4: you remain in the animal’s body.5, 6: You are excreted by the animal ( Go to Green Station.) |
| Green Station: Ground | 1: you soak into the ground and become groundwater. (Go to Brown Station)2: You run off into a nearby lake. (Go to Light Blue Station)3, 4: You soak into the ground and are pulled into a plant by its roots. (Go to Violet Station)5, 6: You evaporate back into the air. (Go to Yellow Station). |
| Brown Station: Groundwater | 1, 2, 3: You remain underground.4,5,6: Humans pump you up (Go to Black Station) |
| Black Station: Human use | 1,2,3: You are drunk by humans (Go to Red Station)4, 5, 6: You are used in a factory to cool machinery. (Go to Grey station) |
| Gray Station: Factory | 1,2,3: You continue to cycle around the pipes in a factory4, 5, 6: You are released into the air as water vapor (gas) and stem (liquid). (Go to Yellow Station) |
| Red Station: Human body | 1, 2: You are exhaled into the air. (Go to Yellow Station)3, 4: You remain in a human’s body.5: You are excreted. You go into a lake. (Go to Light Blue Station)6: You are excreted. You go into groundwater. (Go to Brown Station) |
| Violet Station: Plant | 1,2: You remain a part of the plant3: An animal eats part of the plant. (Go to Orange Station)4: A human eats part of the plant. (Go to Red Station)5, 6: You are evaporated through the plant’s leaves. (Go to Yellow Station) |