

Learning Outcomes:

Nature of Science	Students should be able to review and reflect on the skills and thinking used in carrying out investigations, and apply their learning and skills to solving problems in unfamiliar contexts
Chemical World	Students should be able to develop and use models to describe the atomic nature of matter; demonstrate how they provide a simple way to account for the conservation of mass, changes of state, physical change, chemical change, mixtures, and their separation
Physical World	Students should be able to investigate patterns and relationships between physical observables

Niamh is on an outdoor pursuits trip with her Science and PE teachers. A goal for each student is to take something he or she observed during the trip and enter it as a project for the BT Young Scientist. Niamh is kayaking in the morning and she notices a light fog rising from the lake's surface. She asks her teacher how it formed. The teacher suggests that she create a terrarium for her BT Young Scientist project to learn about the water cycle and how water changes state. Your goal is to develop a terrarium to model the water cycle that Ally could present at the Science Challenge.

Task 1: Research

Begin by discussing the water cycle with your group.

Use the following questions to guide your discussion.

- What is the water cycle?
- What processes make up the water cycle? Define each one in your own words.
- What changes of state does water go through in the water cycle?
- What factors drive the water cycle?
- Which of Earth's systems are involved in the water cycle?

Following your discussion, make a sketch of the water cycle. Refer to your sketch as you begin to design your terrarium.

Task 2: Design the terrarium

Decide what materials will best model the water cycle in your terrarium. Think about the following questions as you select materials to design your model.

- How will your terrarium model the factors that drive the water cycle?
- What elements in your terrarium will represent Earth's systems?
- How will your terrarium model how water changes state?
- How will you show the processes that make up the water cycle in your model?
- How will you make sure that water does not escape the terrarium? Why is this important?

Task 3: Build your model

Obtain the materials needed to build your model and construct your terrarium.

- Make and record observations of the movement of water in your terrarium.
 - How often will you make observations of your model?
 - How will you record them? Design a recording table.
 - How can you use your observations to show others the movement of water in your model?
 - Decide how you will present your model at the BT Young Scientist.

Our recording table:

Student evaluation and reflection on learning:

Reflect on what you learned while you built the model.

- Did you model the factors that drive the water cycle in your terrarium? How?
- What role do Earth's systems play in the water cycle?
- Was your terrarium a closed system? What impact did this have?
- How did you represent the processes of precipitation, condensation, and evaporation in your model?
- Is there an aspect of the water cycle that is not well represented by your model?
- If so, how could you change your model to make it better?

Niamh Barry

JC Science 2017 Specification

- How could your terrarium help Niamh explain the fog she observed in Delphi?