

Handout - Sample Answers

1. **Hypothesis:** How do you think change in temperature will affect your pine cones? (Answer before conducting the experiment).

If the pine cone is placed in warm water then the scales will open and release seeds. If the pine cone is placed in cold water then no changes will occur.

2. **Observations:** Draw or write your observations based on what happens to the cones before and after the temperature change. (example: size, colour, openness of scales)

<u>Before</u>	<u>After</u>
<p>Cone 1: Warm water</p> <ul style="list-style-type: none"> • 10cm long • 2.5cm wide • scales closed tight • light brown 	<p>Cone 1: Warm water</p> <ul style="list-style-type: none"> • 10cm long • 3.5cm wide • scales open • dark brown
<p>Cone 2: Cold water</p> <ul style="list-style-type: none"> • 10cm long • 2.5cm wide • scales closed tight • light brown 	<p>Cone 2: Cold water</p> <ul style="list-style-type: none"> • 9cm long • 2cm wide • scales closed tight • dark brown
<p>Cone 3: Control</p> <ul style="list-style-type: none"> • 10cm long • 2.5cm wide • scales closed tight • light brown 	<p>Cone 3: Control</p> <ul style="list-style-type: none"> • 10cm long • 2.5cm wide • scales closed tight • light brown

3. **Results:** What did you see happen when you exposed pine cones to different temperature environments?

When the pine cones are exposed to warm and cold water, the warm water should make the pine cone open while the cold water will make the pine cone close up even more.

Note that results will vary depending on the type of cone. The important part is being able to follow the scientific procedure.

4. **Reflection:** Why do you think this happened? Do you think other types of cones would react the same?

The pine cone exposed to warm water opened because a warm temperature usually is a sign that spring has come. The spring time provides good conditions for seeds to sprout and grow. The cone exposed to cold water closed up to protect the seeds from the cold and wet environment. Most pine cones from Ontario will react similar to the eastern white pine cones.