

Predictions Worksheet Instructions

Instructions:

Prior to the Day in the Life (DITL) Student Summit Event, use the “Making Predictions” student worksheet provided to have students make predictions about some of the water quality parameters they will be measuring in the field.

In Table 1, students will make predictions about water temperature, turbidity, dissolved oxygen, pH, phosphate, nitrate, and overall water quality. Make sure students carefully read the background information provided and keep their predicted values within the given ranges.

Before students make their predictions, it may be helpful to review existing data as a class so that their predictions are well informed. To start, look at the water quality data collected by students from last year’s Student Summit, which is provided as an Excel file in the DITL Box folder. You may also explore available data using the NYS Department of Water (DOW) Monitoring Data Portal following the instructions outlined below:

1. Visit DOW Monitoring Data Portal at:
<https://nysdec.maps.arcgis.com/apps/webappviewer/index.html?id=692b72ae03f14508a0de97488e142ae1>
2. Type your stream or sampling location into the search bar.
3. Click on a stream monitoring point (orange dot) closest to your sampling location.
4. Scroll down to “Related tables” in the pop up box. For this exercise, select the “Chemistry” table by clicking on the arrow next to it.
5. Once the related records are displayed, select the water chemistry parameter you are interested in exploring. For this exercise, look at temperature, dissolved oxygen, pH, nitrate, and phosphate by clicking on the arrows next to them. To view all of the chemistry data in one table, click the three dots at the bottom of the list and select “View in Attribute Table”.
6. If you want to export this data into a .csv file, click “Options” in the upper left-hand corner of the table and select “Export all to CSV”.

After the Student Summit Event, have students transfer the actual data they collected for water temperature, turbidity, dissolved oxygen, pH, nitrate, phosphate, and water quality into Table 2. Students can then compare their predictions to the real data and think about how and why these values might differ. As a class, discuss what they learned about water quality and the waterbody at their sampling location.

Making Predictions: Student Worksheet

Name: _____

Table 1: Predictions	
Parameter	Prediction
<p>Water Temperature (°F) Most aquatic organisms live in an optimal temperature range of 41-77 °F.</p>	
<p>Turbidity (cm) Transparency measurements (in centimeters) typically decreases with an increase in:</p> <ul style="list-style-type: none"> • Runoff carrying sediment and particles into the water • Erosion carrying sediment into the water • Algae growing in the water • Seasonal mixing (for lakes and ponds) <p>Cloudy- or turbid- water can decrease how much oxygen fish can use from the water. This can also stop light from reaching plants beneath the surface.</p>	(within 0-60 cm)
<p>Phosphate (ppm) Phosphate levels may increase with runoff containing animal waste or fertilizer, discharge containing sewage, and runoff containing decomposing plants or lawn waste.</p>	(within 0-4 ppm)
<p>Nitrate (ppm) Nitrate levels may increase with runoff containing animal waste or fertilizer, discharge containing sewage, and runoff containing decomposing plants or lawn waste.</p>	(within 0-40 ppm)
<p>Dissolved Oxygen (ppm) A healthy stream DO range is 5-11 ppm. DO will increase with:</p> <ul style="list-style-type: none"> • Lower water temperatures • High photosynthesis levels • Increased stream flow that results in increased mixing of atmospheric dissolved oxygen into water <p>DO will decrease with:</p> <ul style="list-style-type: none"> • Suspended particles in the water • Warmer water temperatures 	(within 0-14 ppm)
<p>pH A healthy stream pH range is 6.5-8.2. Water pH may decrease with:</p> <ul style="list-style-type: none"> • Rainfall, especially if rain is acidic. • Runoff from mines • Industrial discharge • Runoff containing cleaners and degreasers <p>Water pH may increase with:</p> <ul style="list-style-type: none"> • Runoff from washing concrete mixing equipment • Runoff or discharge containing soaps and detergents 	(within 0-14)
<p>Water Quality Water quality is dependant upon many variables. Make a prediction about the water quality at your site and compare this with your Water Quality Index.</p>	(poor/fair/good/excellent)

Table 2: Comparing Predictions and Results

Parameter	Actual Result	How did your actual result compare to your prediction?
<p>Water Temperature (°F) Most aquatic organisms live in an optimal temperature range of 41-77 °F.</p>		
<p>Turbidity (cm) Under 50 cm: Fish and other aquatic wildlife begin to demonstrate signs of stress. Under 60 cm: Not recommended for recreational use.</p>		
<p>Phosphate (ppm) Typical range for rivers: 0.11 - 0.34 ppm Typical range for lakes: 0.05 - 0.13 ppm</p>		
<p>Nitrate (ppm) Water with higher than 10ppm nitrate may be cause for concern and warrents further investigation.</p>		
<p>Dissolved Oxygen (ppm) Typical range for rivers: 8.7 - 12.9 ppm Typical range for lakes: 7.4 - 10.4 ppm</p>		
<p>pH Most aquatic organisms require habitats with a pH of 6.5 - 9.0.</p>		
<p>Water Quality (poor/fair/good/excellent)</p>		