Career Exploration Centre

Online

SAIT YOUNG ORIGINALS

Environmental Technologist

Career Description

Environmental technologists provide technical support and services to scientists, engineers, and other professionals in the field of environmental protection.

They are employed by:

- Consulting, engineering, and construction companies
- Public works and waste management
- Transportation, water treatment, and chemical manufacturing

Working conditions:

Environmental technologists work in many different environments including offices, labs, and the outdoors. They are trained on and work with high-tech, specialized instrumentation and equipment. They work both in teams and independently.

Skills & Abilities:

Environmental technologists must:

- Participate in field surveys, inspections, and technical investigations
- Prepare engineering designs and drawings
- Research and investigate project outcomes

Stats:

Average salary In Alberta: $82,982.00 Annually*
Average wage: $42.06 Hourly*

*Statistics from 2017, alis.alberta.ca

For more Alberta career Information and stats: https://alis.alberta.ca/occinfo/occupations-in-alberta/occupation-profiles/environmental-engineer/

Activity Mission

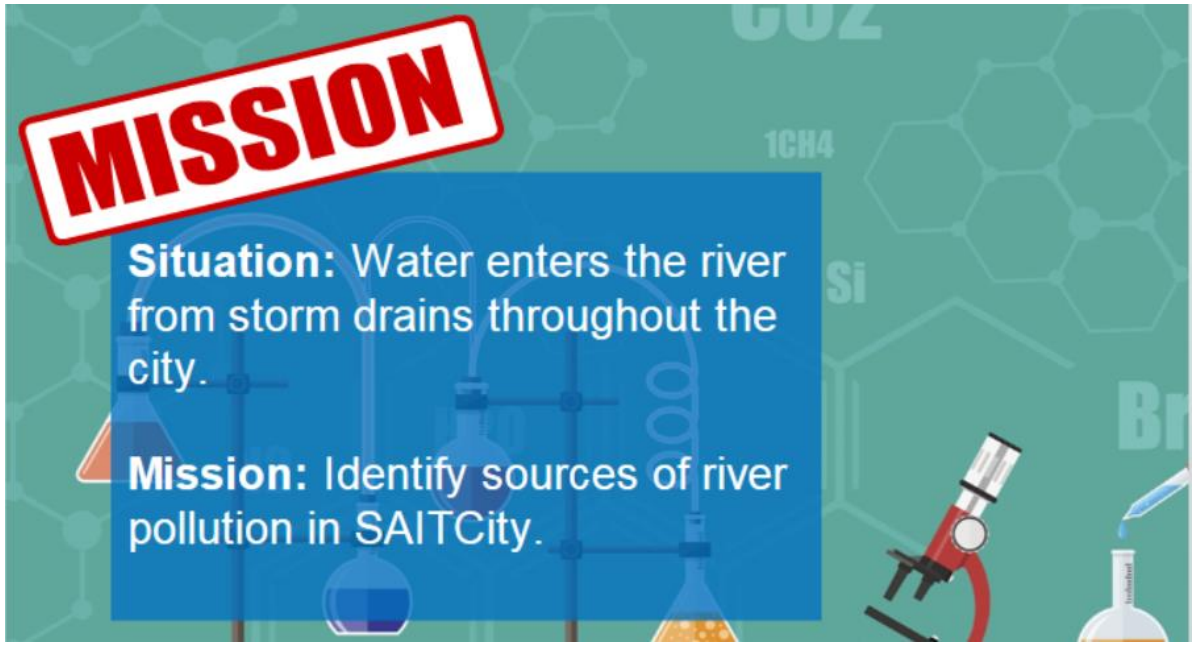
You are working in a fictional location called SAITCity and will complete two duties of an environmental technologist:

1. Identify sources of river pollution
2. Create a graph with the data provided
3. Write a recommendation

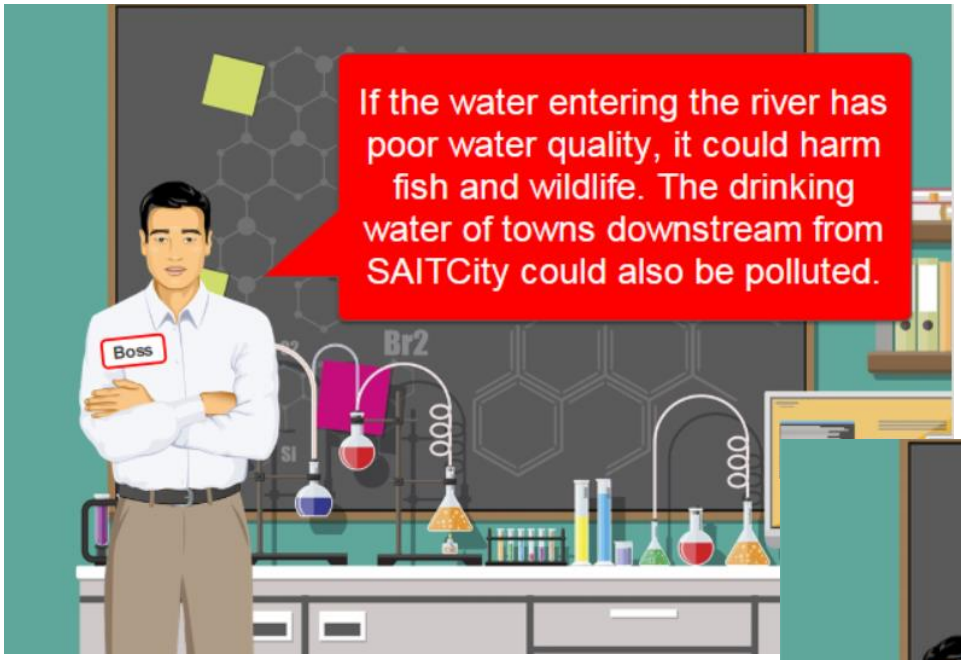
Tools:

Pen or pencil and paper.

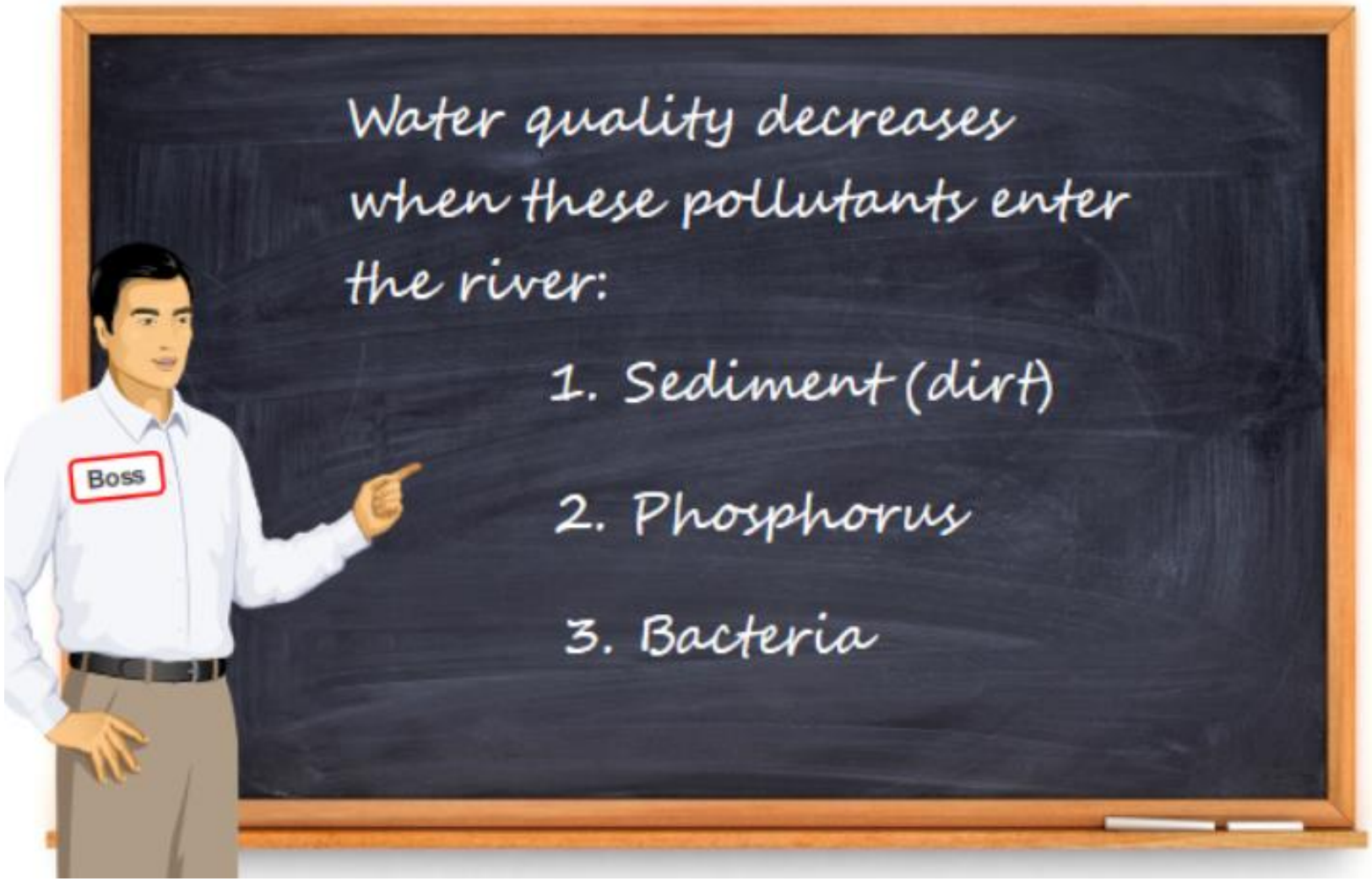
Task 1: Identify Sources of River Pollution



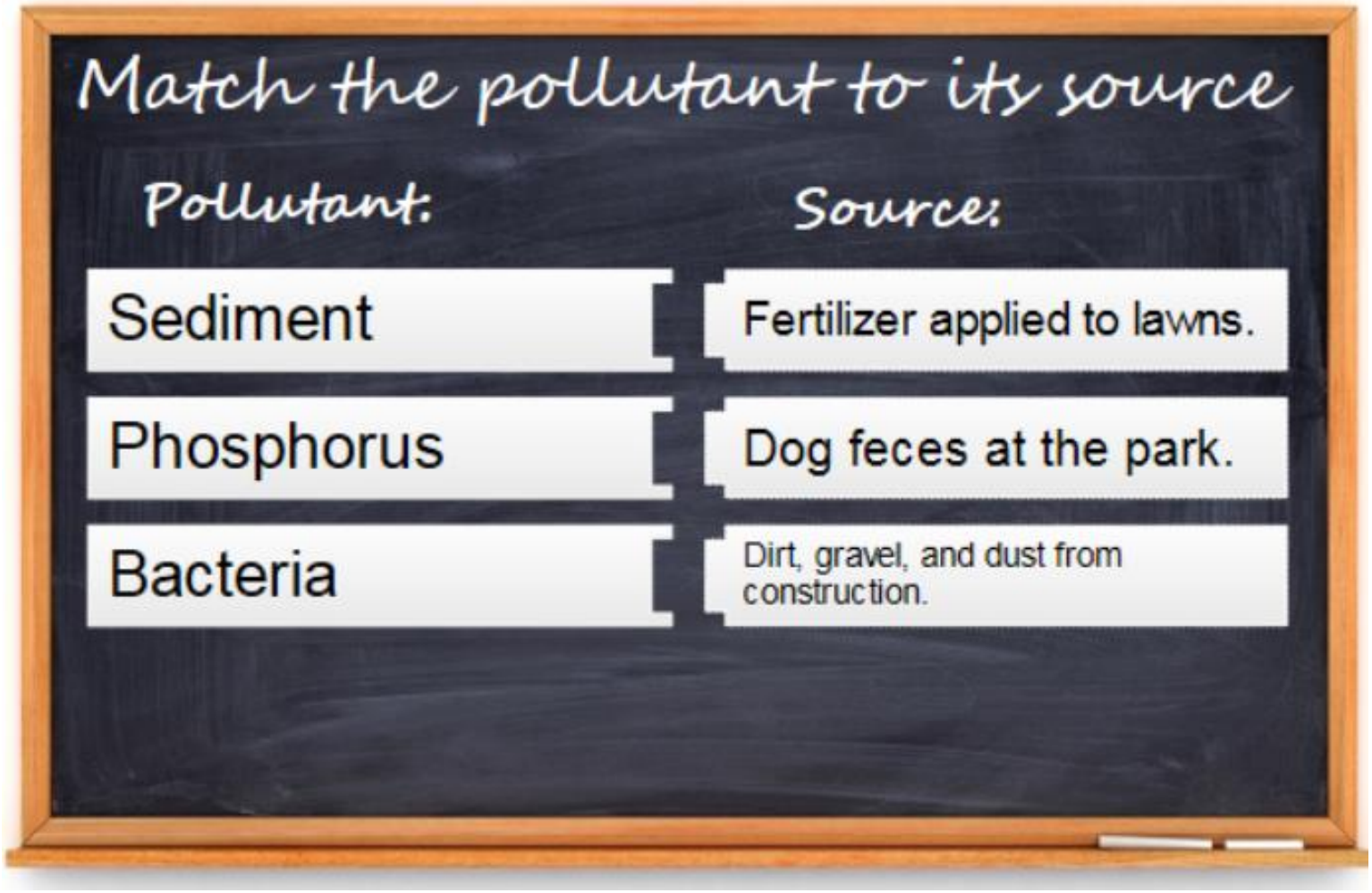
Heading 4


If the water entering the river has poor water quality, it could harm fish and wildlife. The drinking water of towns downstream from SAITCity could also be polluted.
Boss
Br2

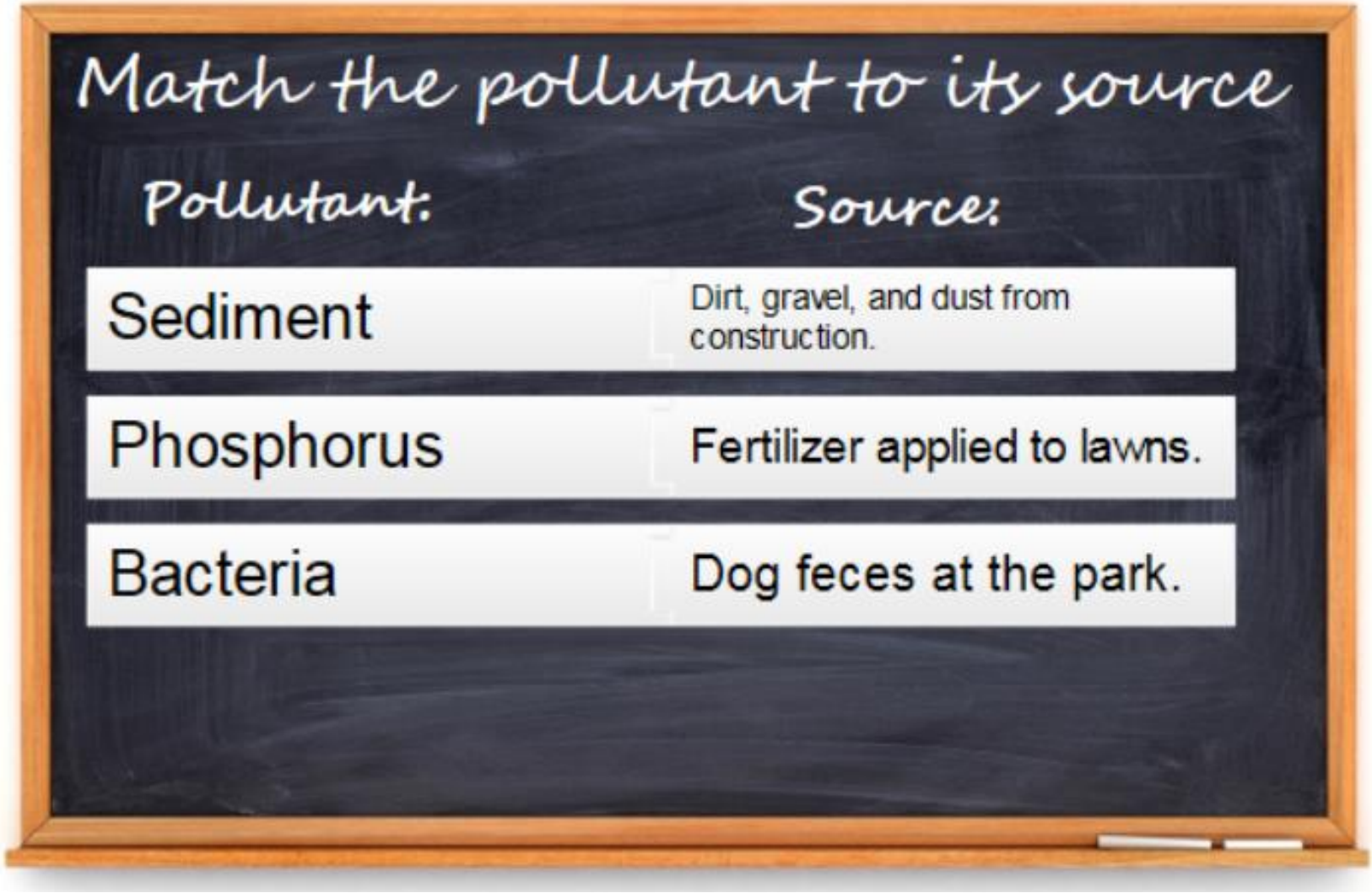

Environmental Technologists working in SAITCity measure water quality to ensure it is clean and safe so no harm will come to wildlife or people.
Boss

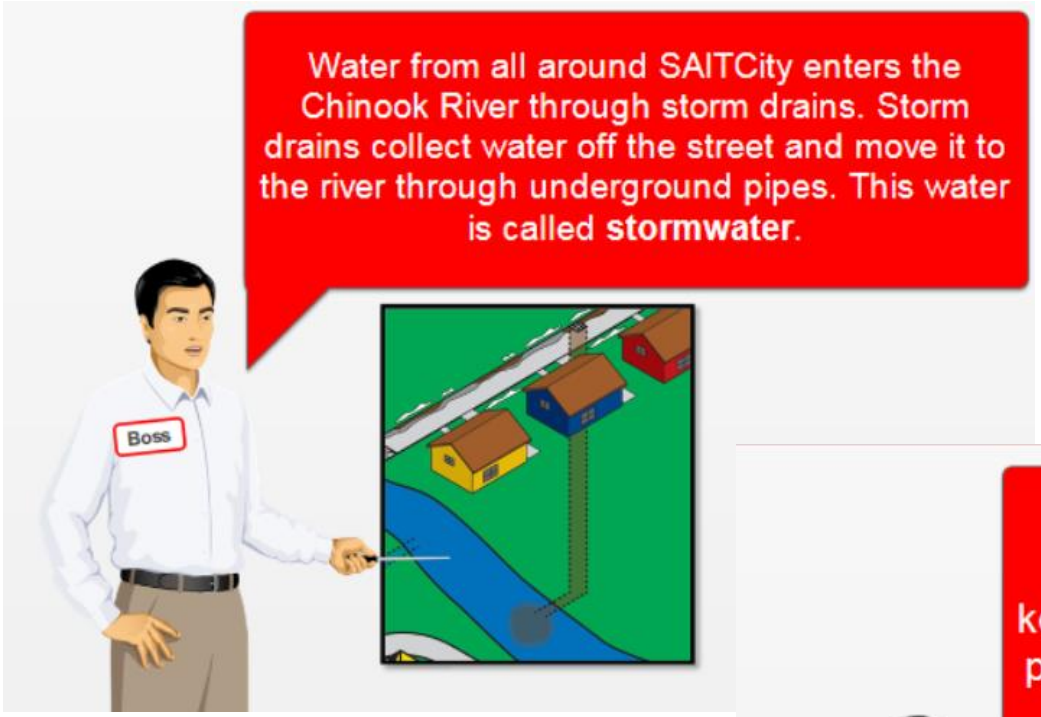

Water quality decreases when these pollutants enter the river:
1. Sediment (dirt)
2. Phosphorus
3. Bacteria
Boss

Use a pencil and paper to write your answers.

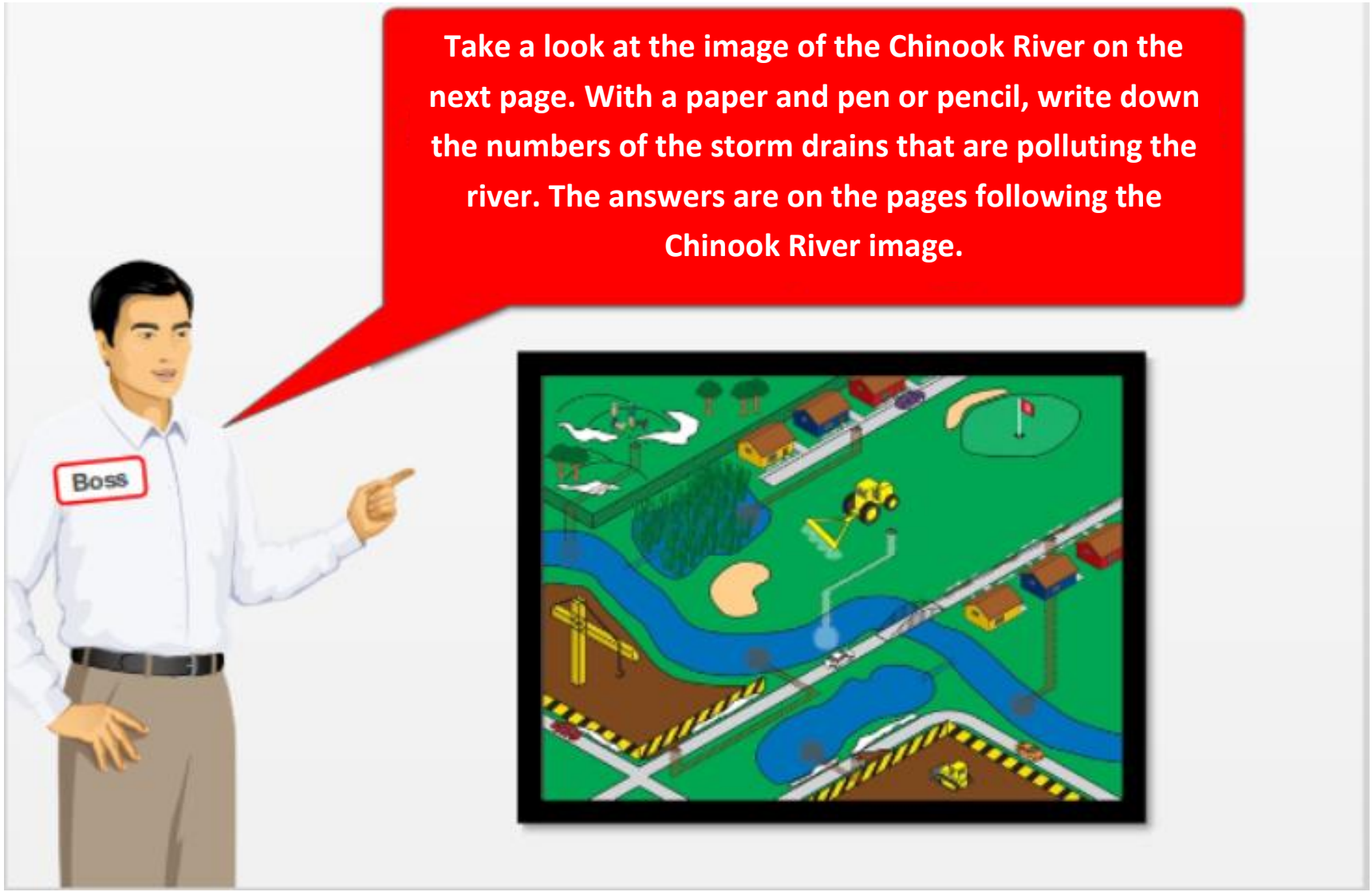


Check the answer on the next page!


Match the pollutant to its source
Pollutant:
Source:
Sediment
Dirt, gravel, and dust from construction.
Phosphorus
Fertilizer applied to lawns.
Bacteria
Dog feces at the park.


Water from all around SAITCity enters the Chinook River through storm drains. Storm drains collect water off the street and move it to the river through underground pipes. This water is called **stormwater**.
Boss


Stormwater is not treated by SAITCity. We rely on citizens and businesses to keep their streets clean to keep sediment, phosphorus, and bacteria out of the river.
Boss

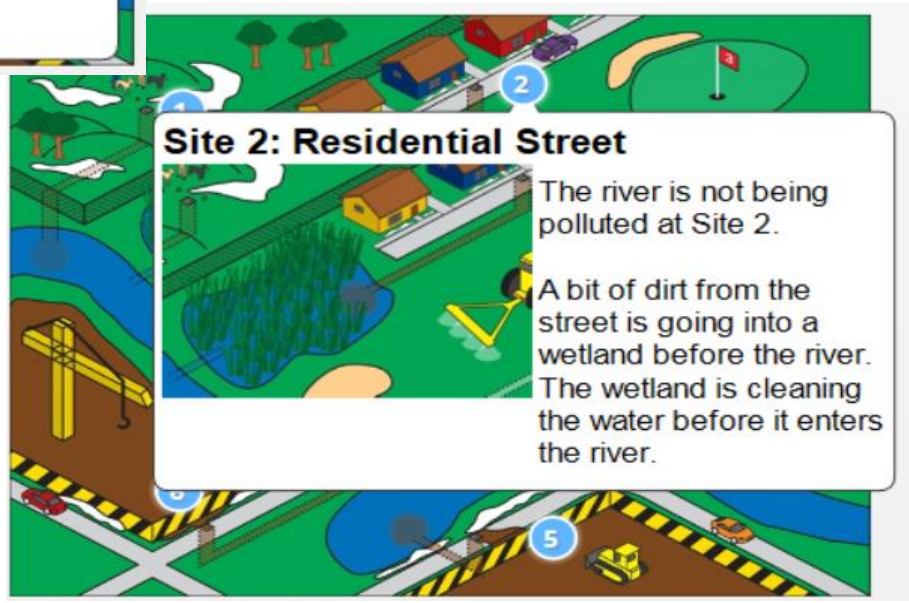

Take a look at the image of the Chinook River on the next page. With a paper and pen or pencil, write down the numbers of the storm drains that are polluting the river. The answers are on the pages following the Chinook River image.
Boss

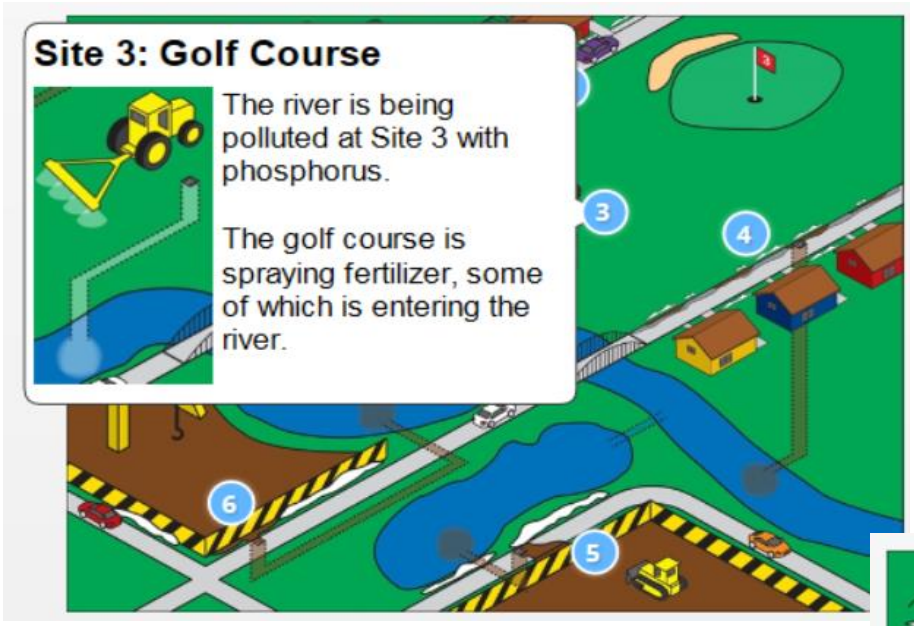
On a piece of paper, write down the numbers of the locations that you think are contaminating the river.
How are the locations contaminating the water?

Check the answers over the next 3 pages!


1
2
6
Site 1: Dog Park
The river is being polluted with bacteria at Site 1.
Dog feces are contaminating the river with bacteria. Owners need to pick up their dogs' waste.

ANSWERS


2
5
Site 2: Residential Street
The river is not being polluted at Site 2.
A bit of dirt from the street is going into a wetland before the river. The wetland is cleaning the water before it enters the river.



ANSWERS

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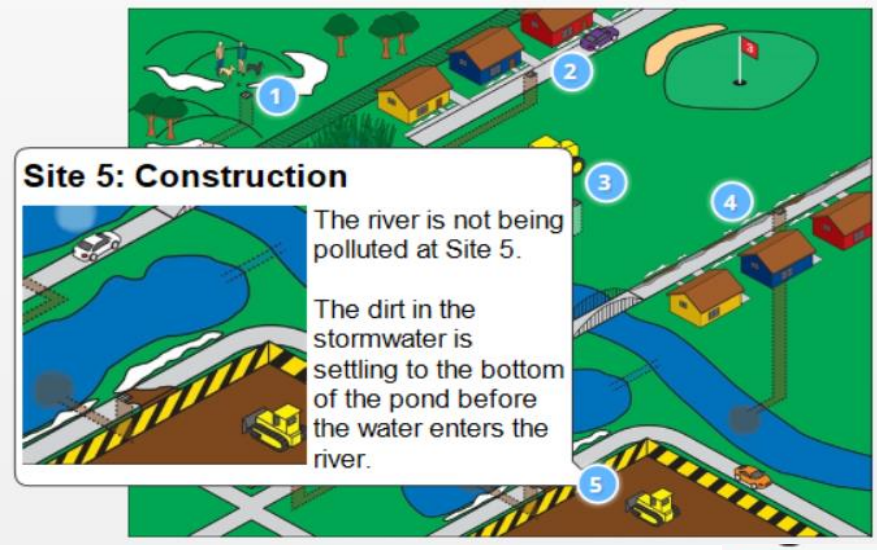
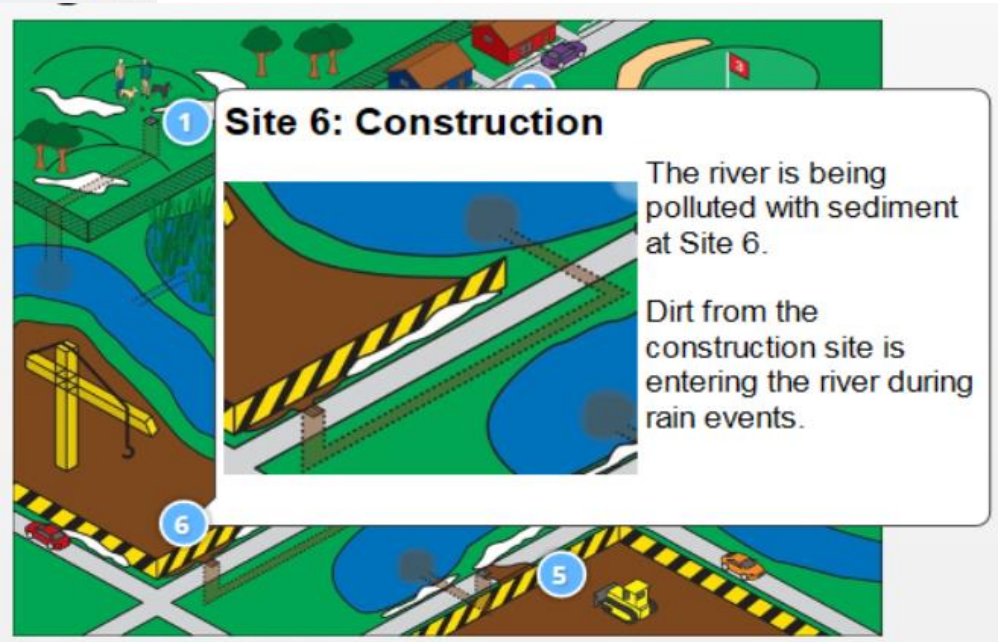


ANSWERS



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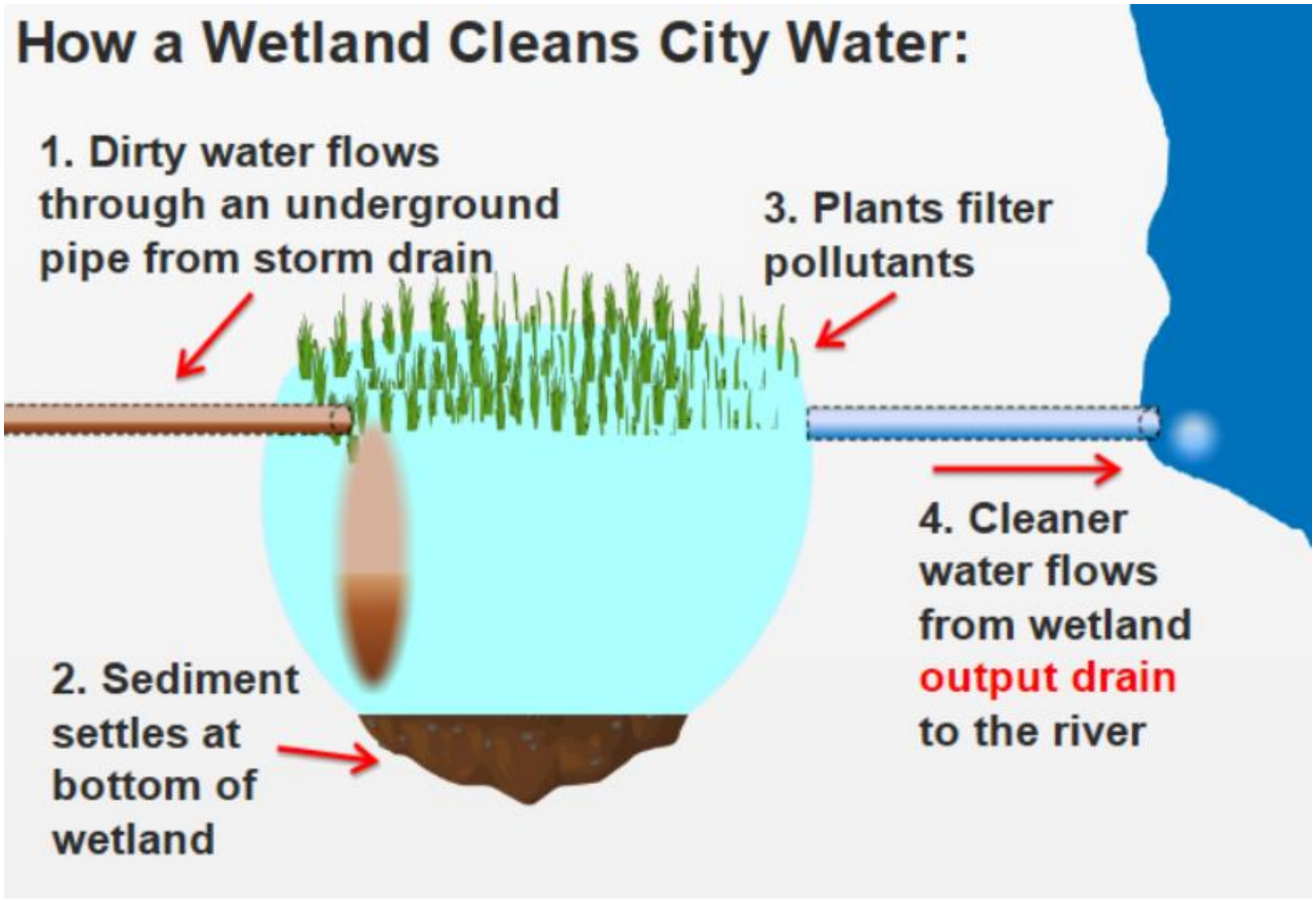

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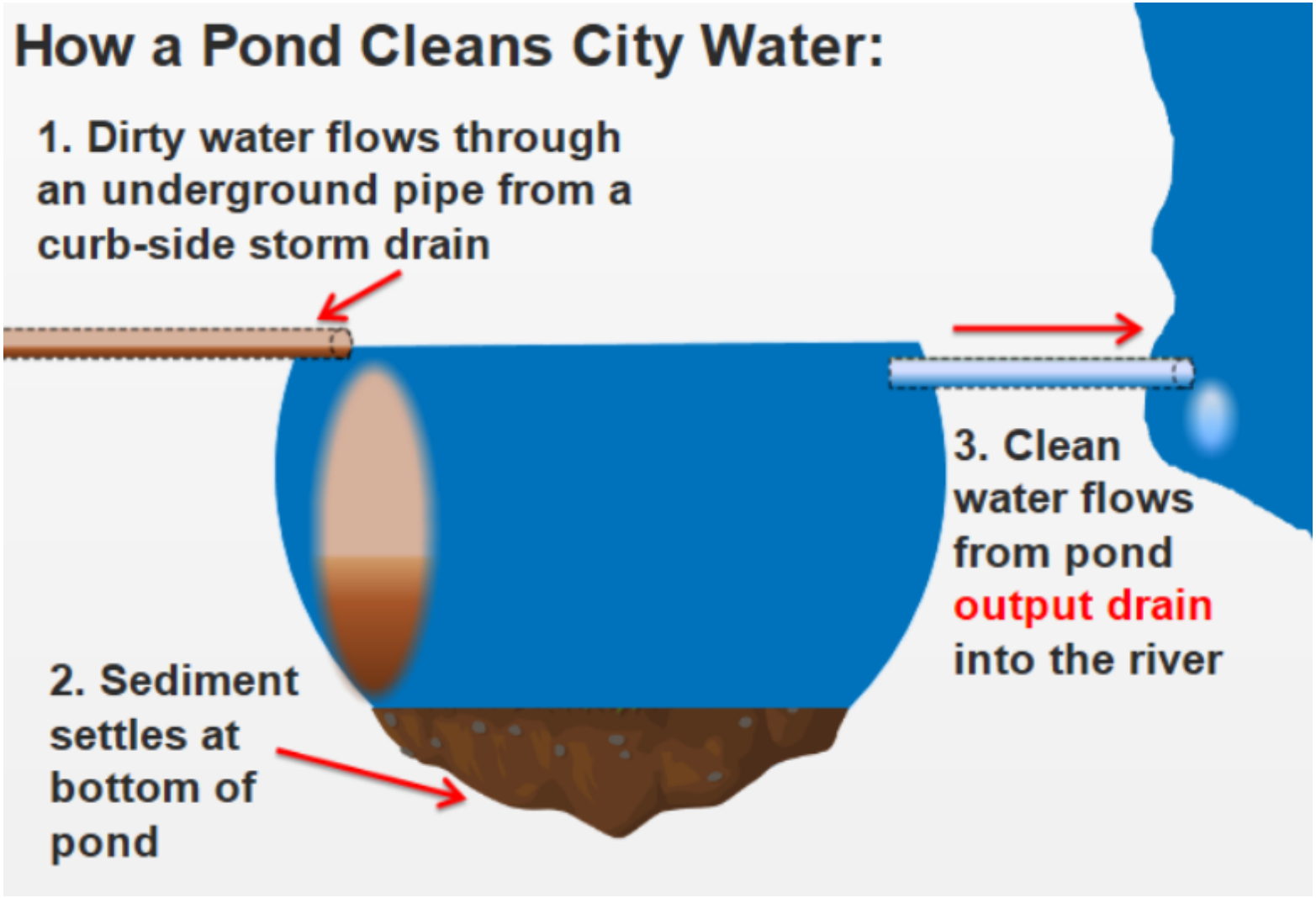
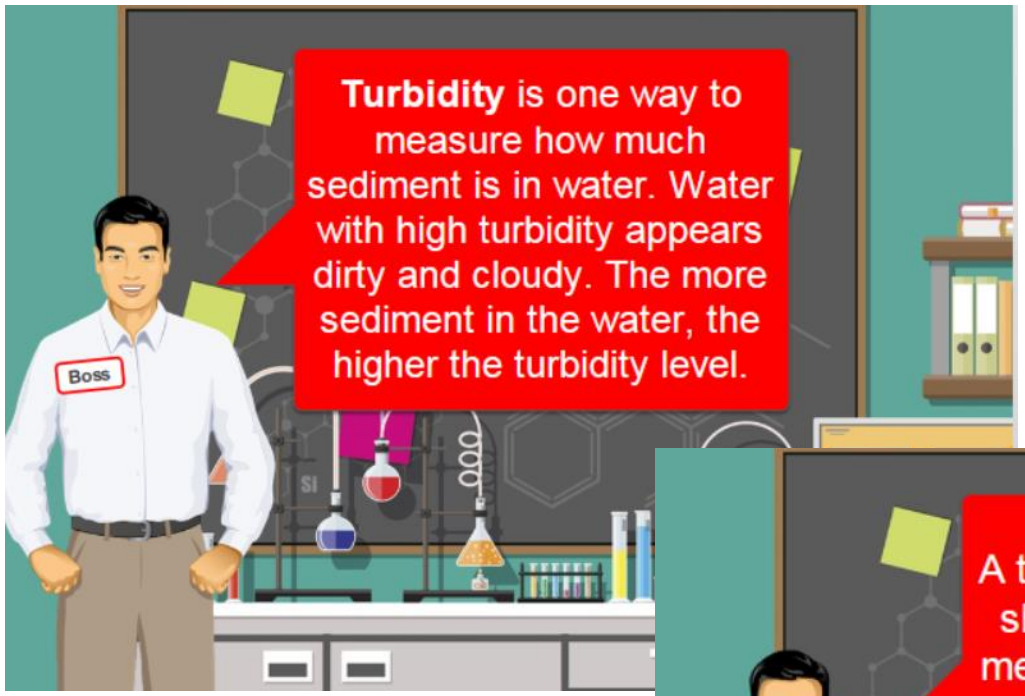
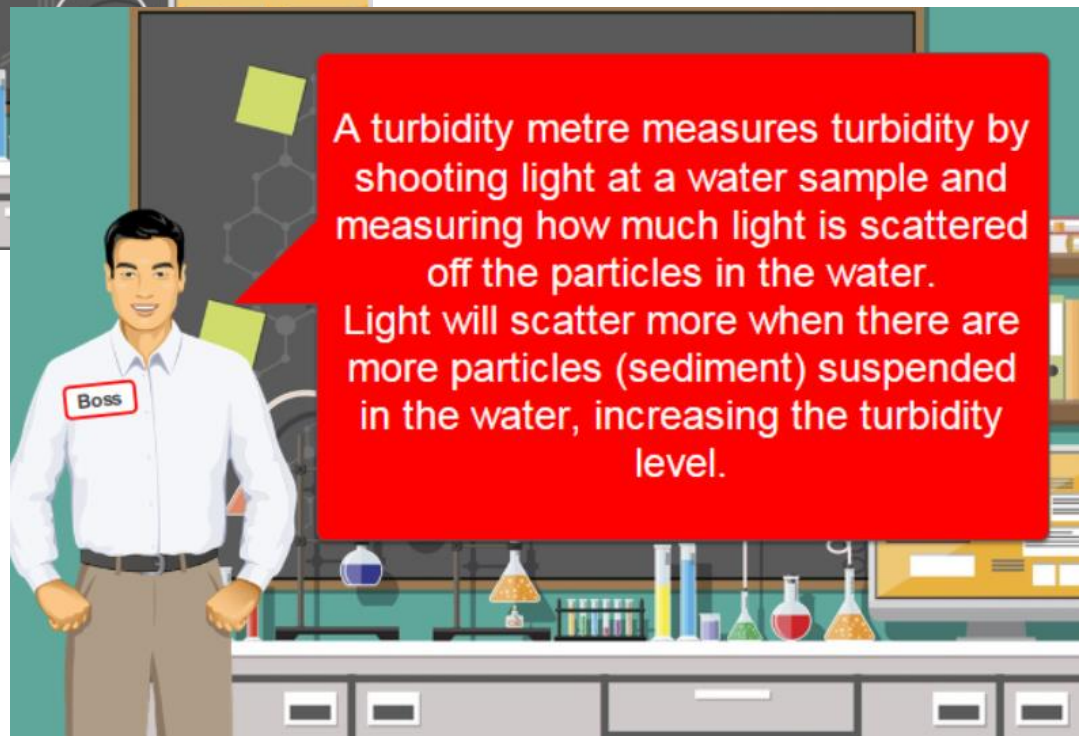
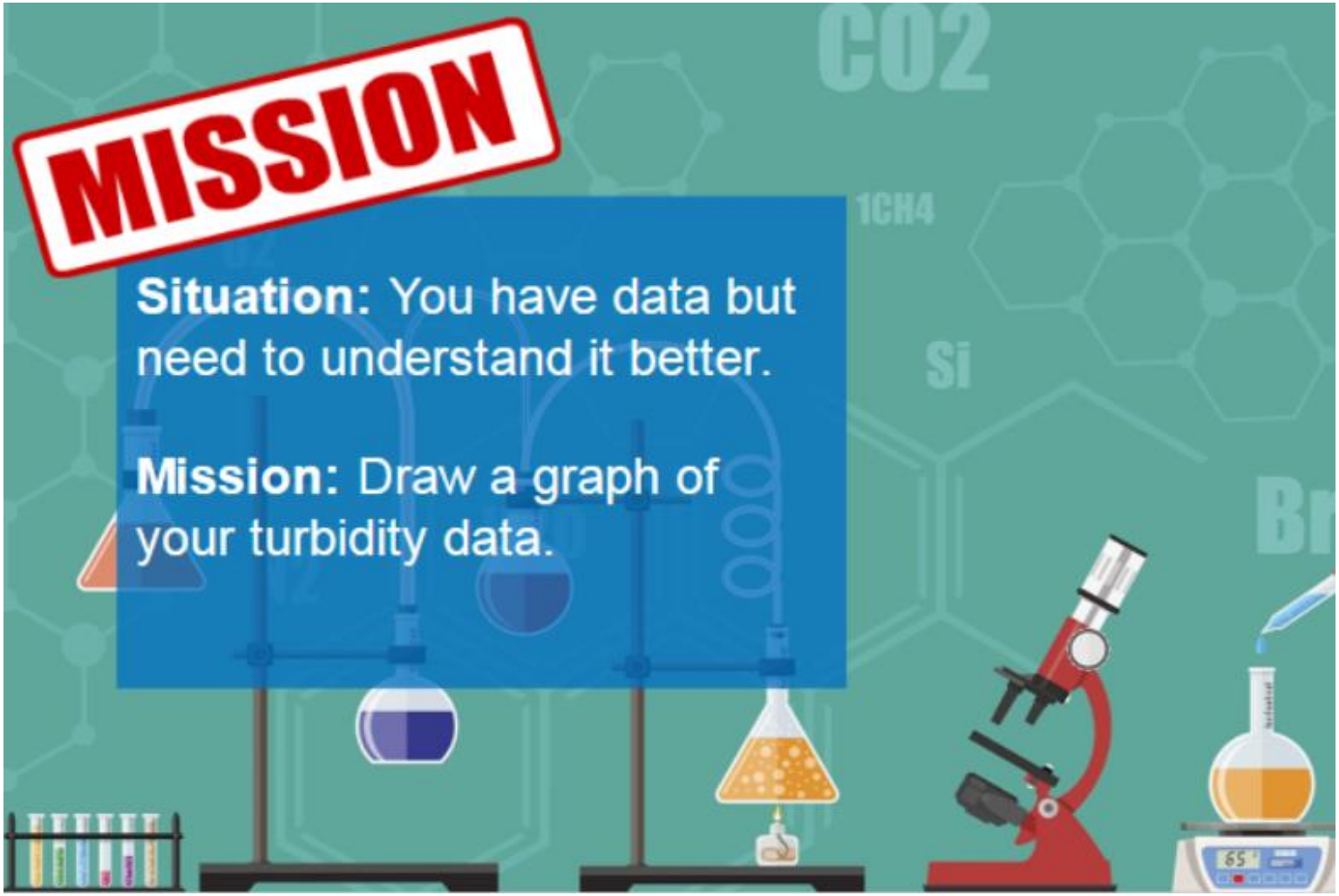
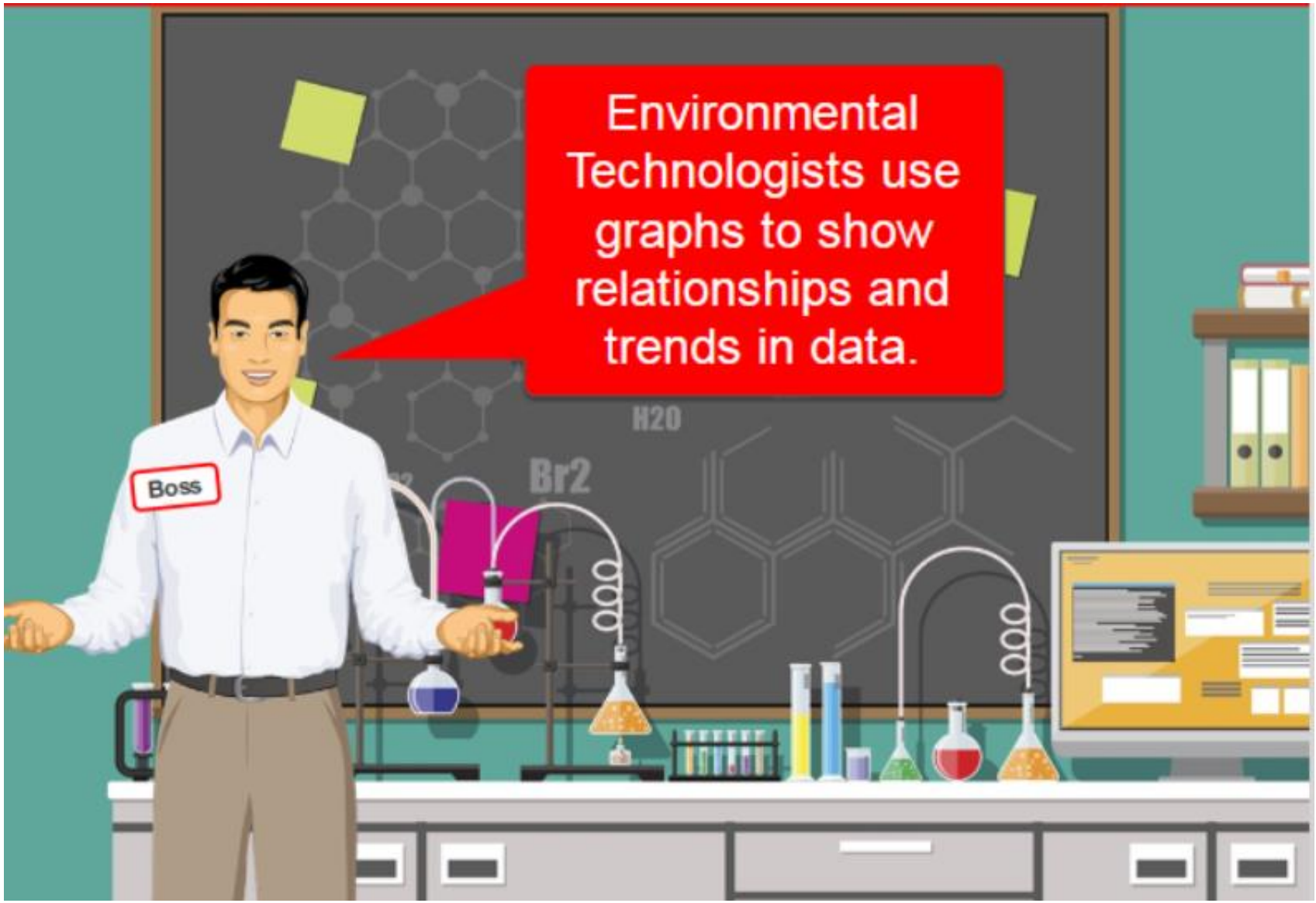



Turbidity is one way to measure how much sediment is in water. Water with high turbidity appears dirty and cloudy. The more sediment in the water, the higher the turbidity level.
Boss


A turbidity metre measures turbidity by shooting light at a water sample and measuring how much light is scattered off the particles in the water.
Light will scatter more when there are more particles (sediment) suspended in the water, increasing the turbidity level.
Boss

Task 2: Create a Graph with Data Gathered




Environmental Technologists use graphs to show relationships and trends in data.
Boss
H20
Br2

Discuss Graph Options

Below is all of the data from the 3 sites to include in your graph. The numbers are the **turbidity** levels at each site, on each date.

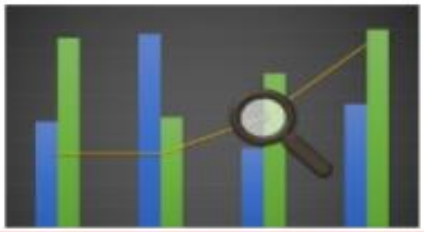
You are preparing a report to present to the city and your graph is to justify your recommendation to build and additional pond or wetland.

If possible, appoint a co-worker in your home to discuss which graph style you should use. Your graph choices are on the next page.

Sample Location:	20-Jun	27-Jun	4-Jul	**11-Jul**
1: Storm Drain	391	381	325	350
2: Wetland	44	40	29	47
3: Pond	28	19	17	30

With the data that you have, which graph style should you use?

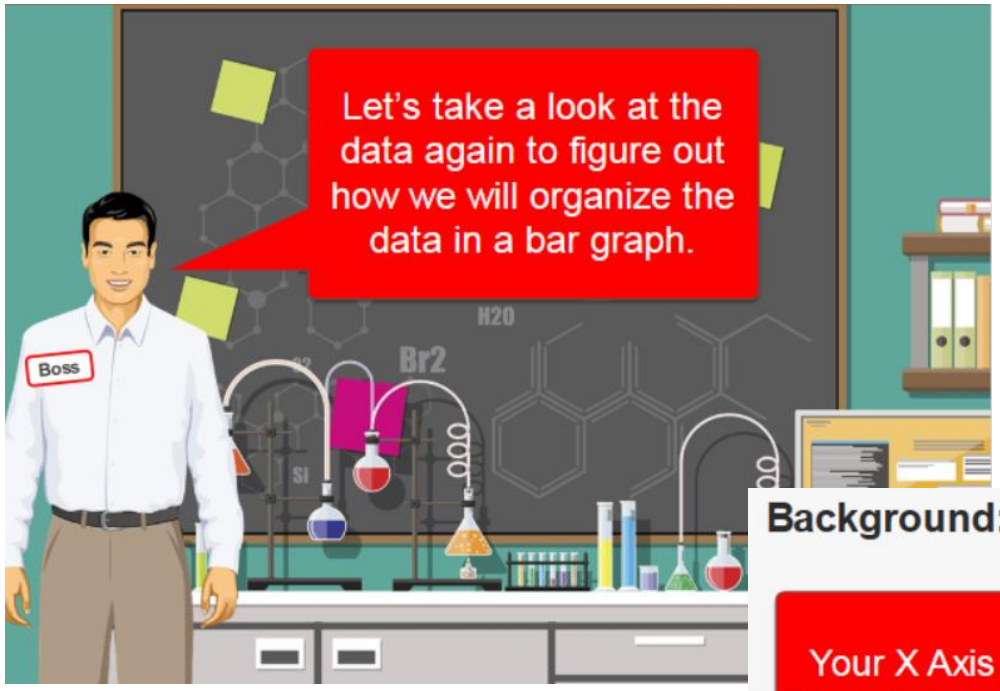
Read the description of each graph style below.

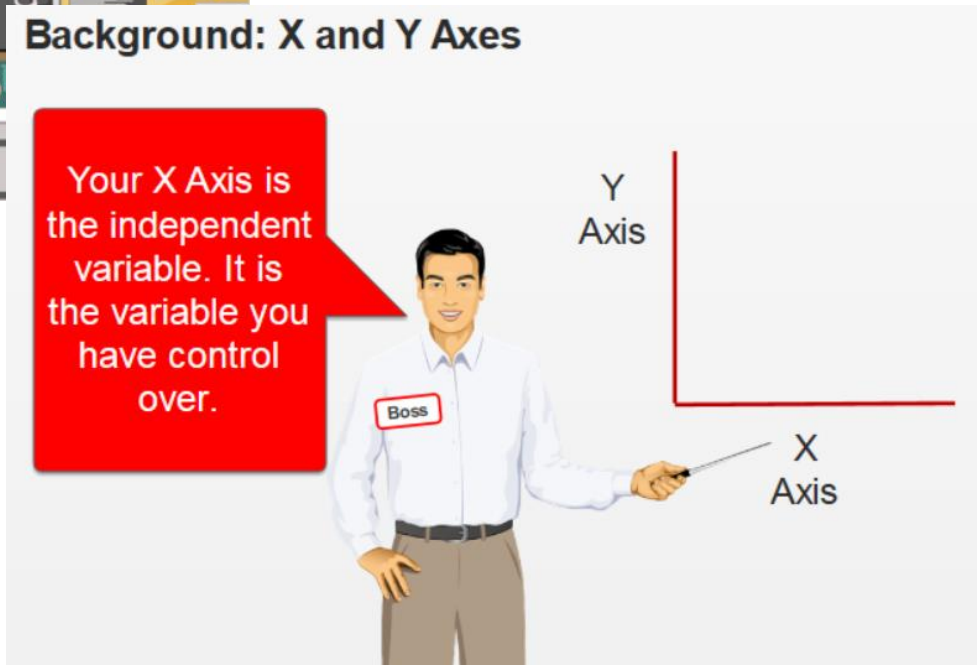
Pie Chart	Bar Graph	Line Graph
		
Used to compare amounts, usually percentages. For example, if you collected data on customers' favourite flavour of popsicle:65% prefer cherry, 20% prefer banana, etc.	Used to compare different groups of data. For example, a bar graph could show average daily temperatures of two different cities side-by-side, for a series of dates.	Used to show the continuous relationships between 2 or more variables. For example, a line graph could show sales numbers for a product from January to December.

Check the answer on the next page!

You will use a bar graph!

Bar graph





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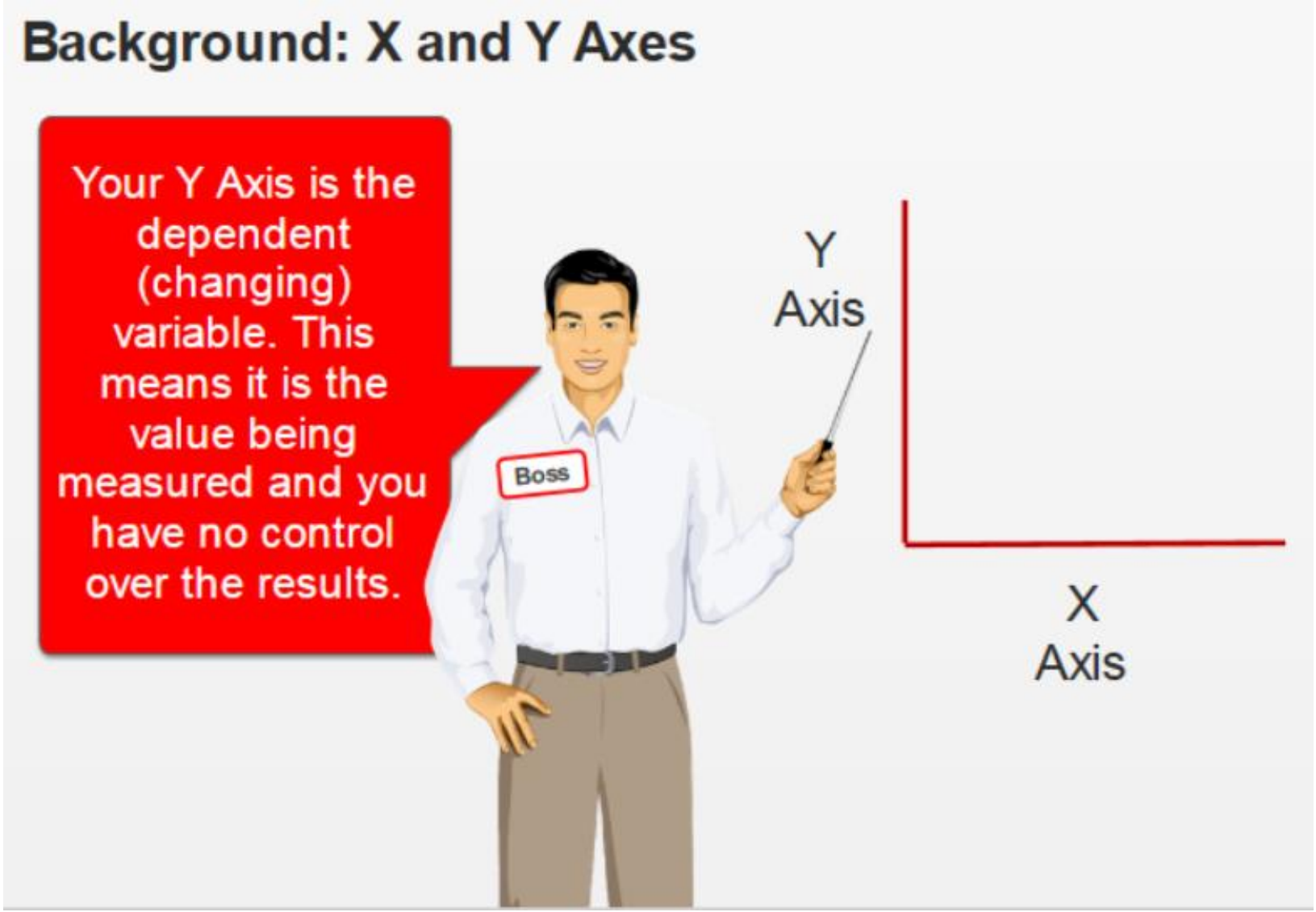
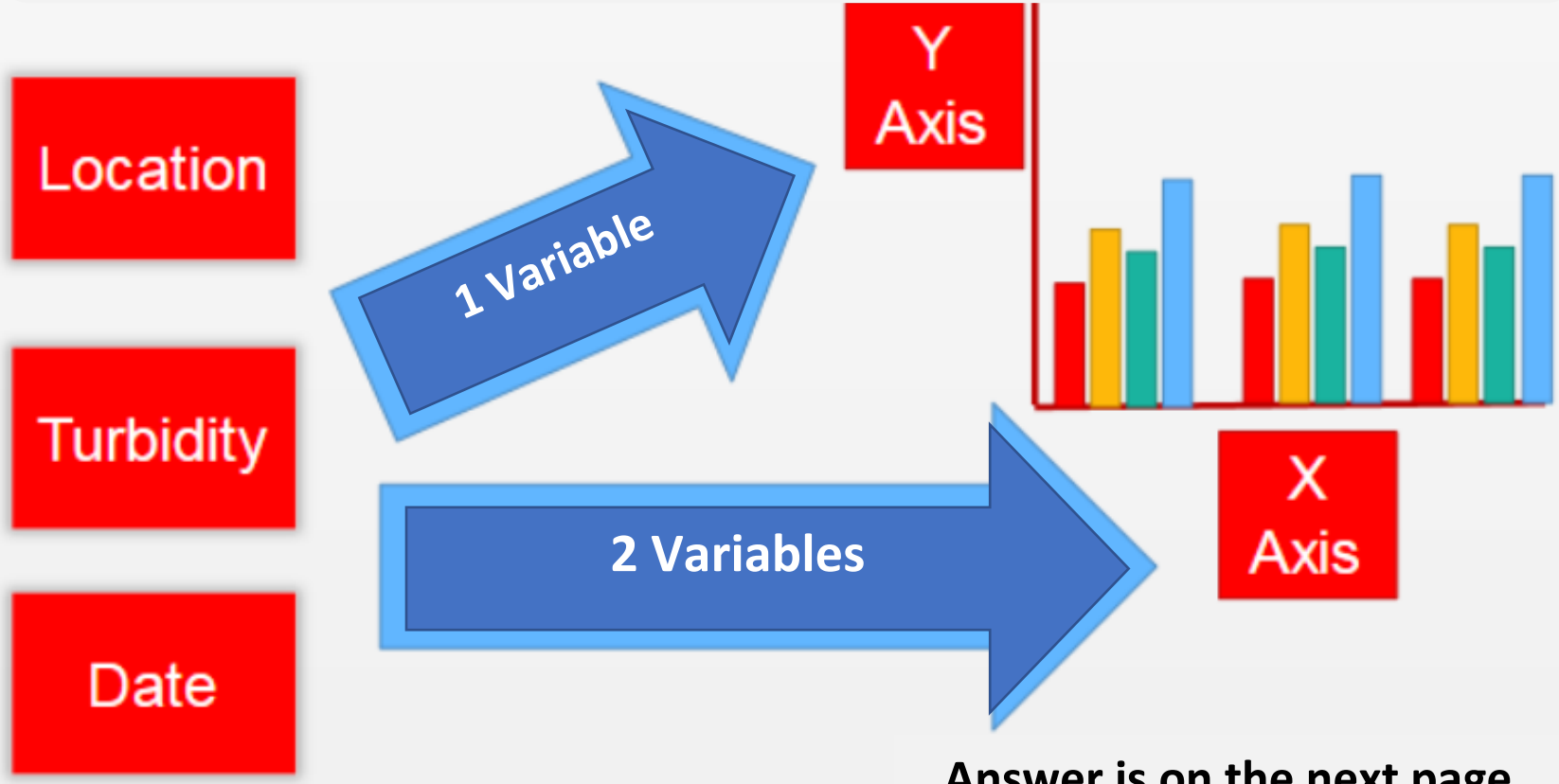
Background: X and Y Axes



Step 1: Decide on X and Y Axis

Decide the location of the 3 variables (the X axis has 2 of the 3 variables) use your pen and paper to record your answers:

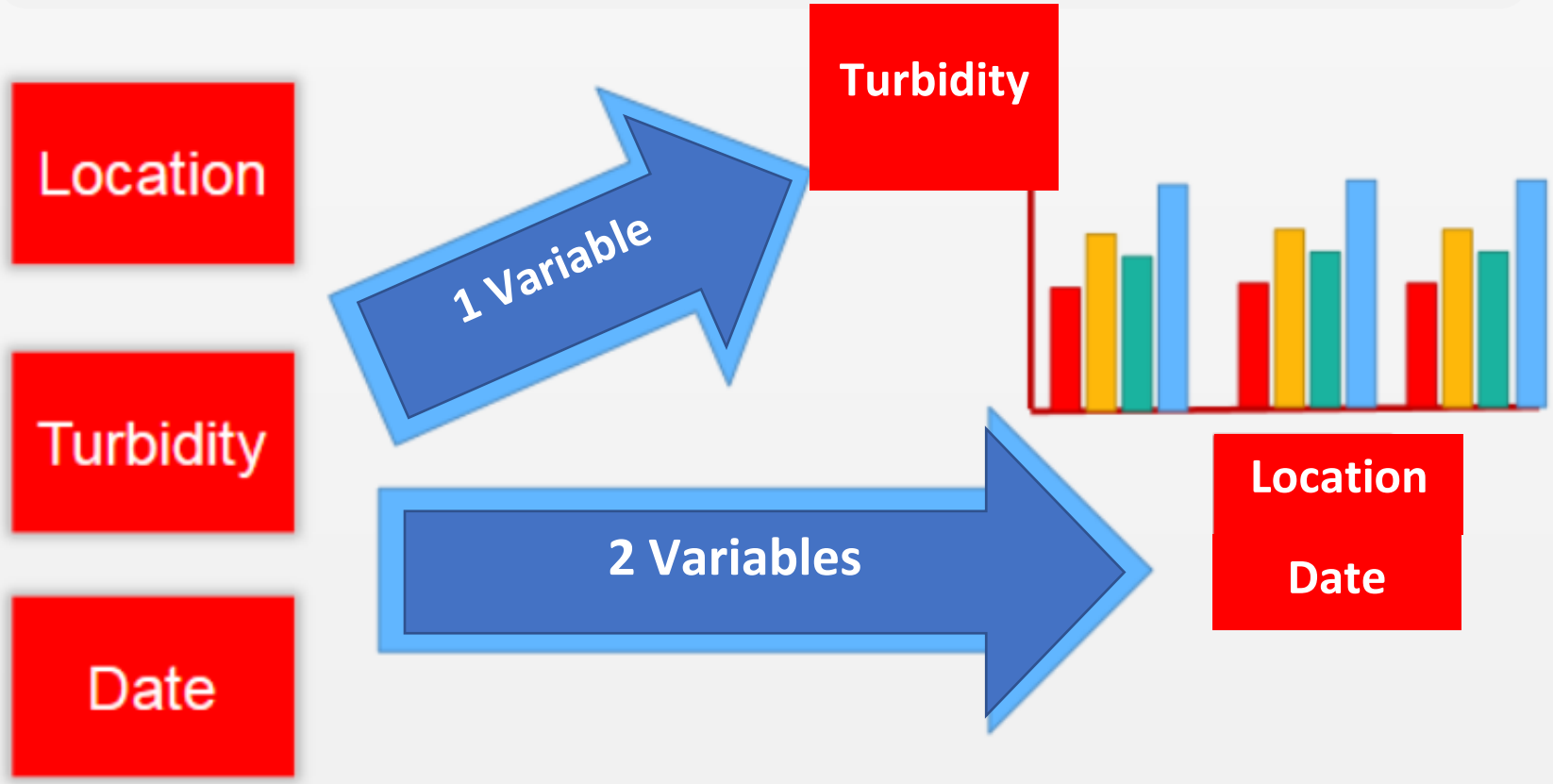


Answer is on the next page.

SAIT YOUNG ORIGINALS

Step 1:

ANSWER



Step 2: Create Bar Graph

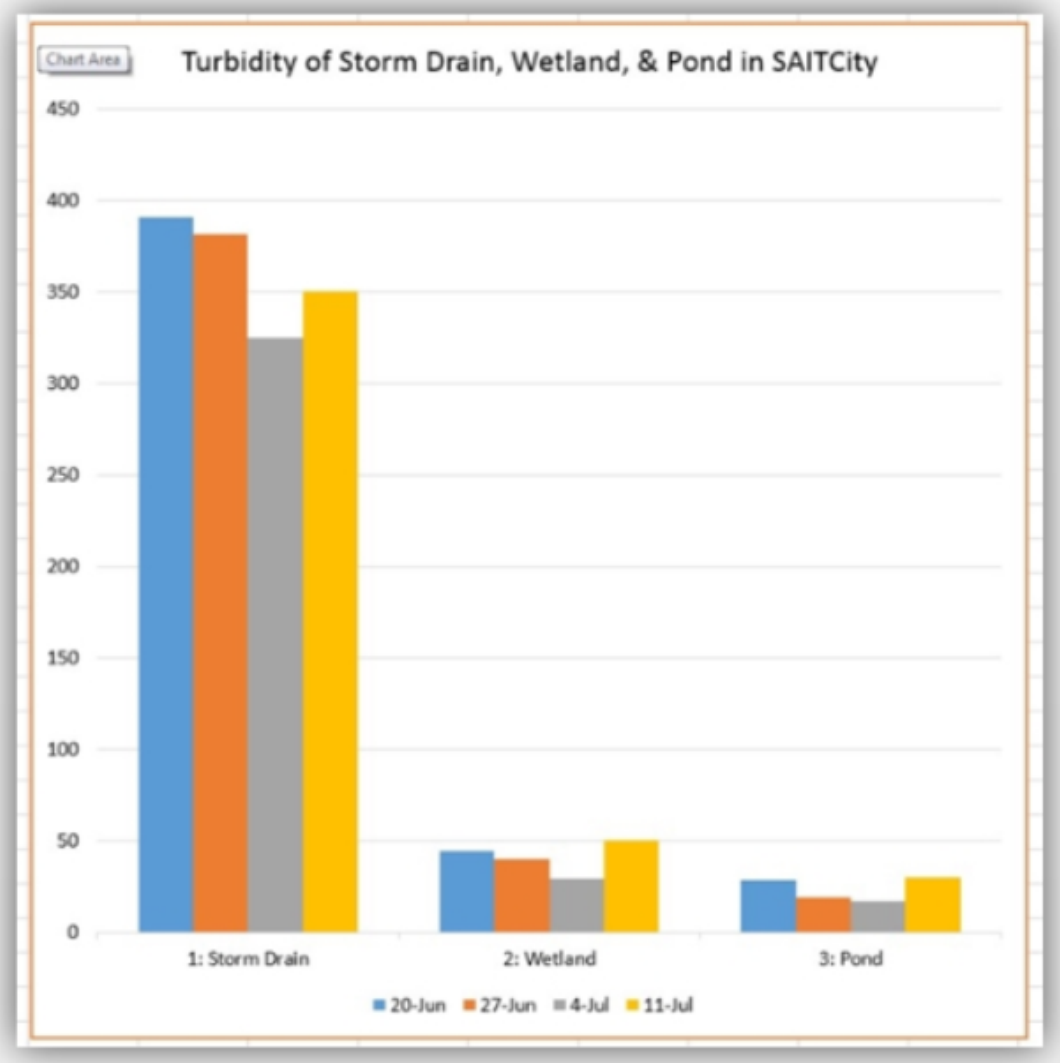
With the information below, and what you have learned in Step 1, create your bar graph. You can create it on paper with pencils/pens, or you can open an Excel document on a computer and create it digitally. The turbidity level (NTU) on your Y axis should be presented in increments of 50, starting at zero: 0 – 50 – 100 – 150 – etc., vertically up the Y axis.

	Turbidity Levels (NTU)			
	20-Jun	27-Jun	4-Jul	11-Jul
1: Storm Drain	391	381	325	350
2: Wetland	44	40	29	47
3: Pond	28	19	17	30

Once you have completed your graph, check the answer on the next page.

Step 3: Check Graph

Your graph should look similar to the one on the right.



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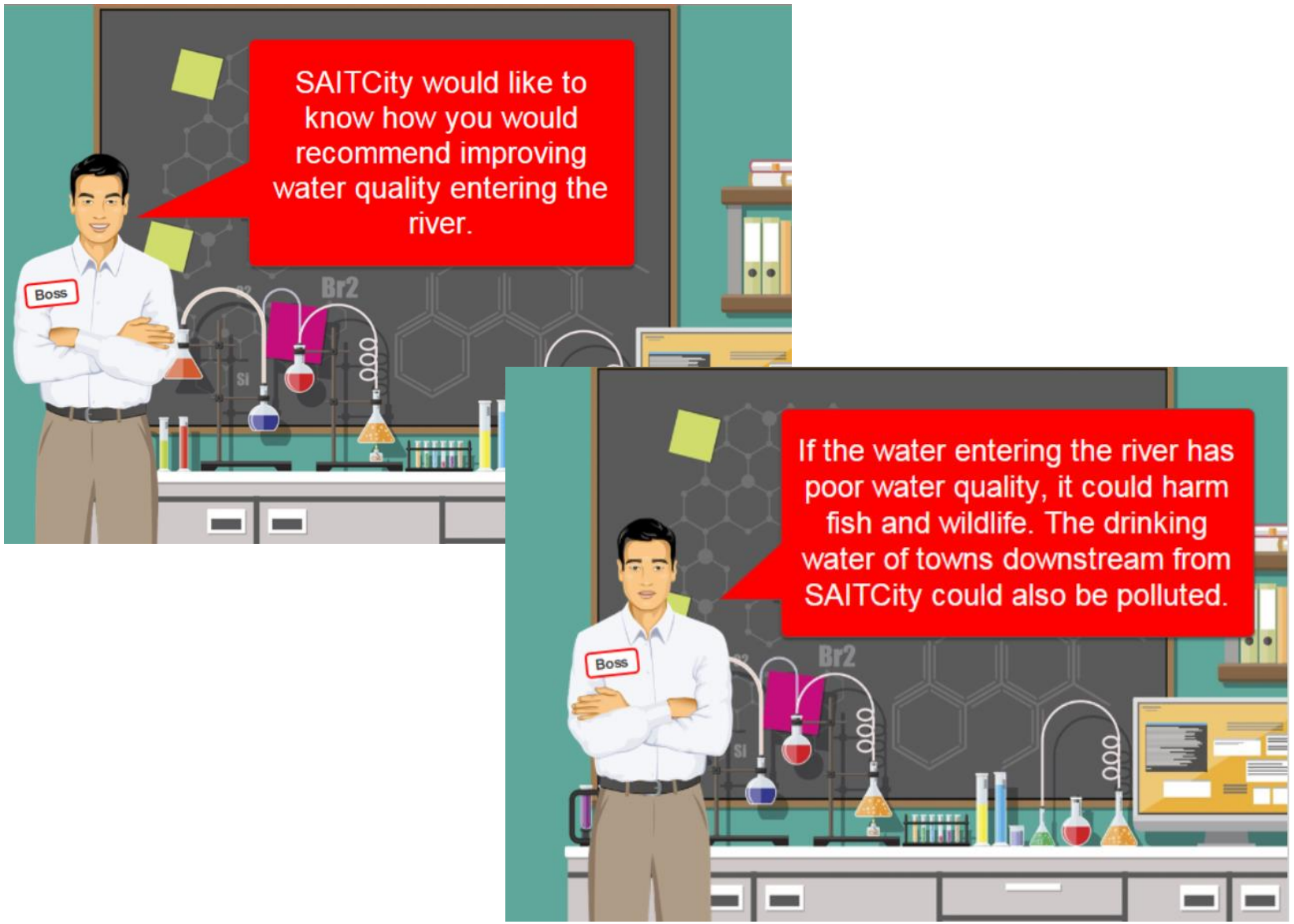
Task 3: Make a Recommendation



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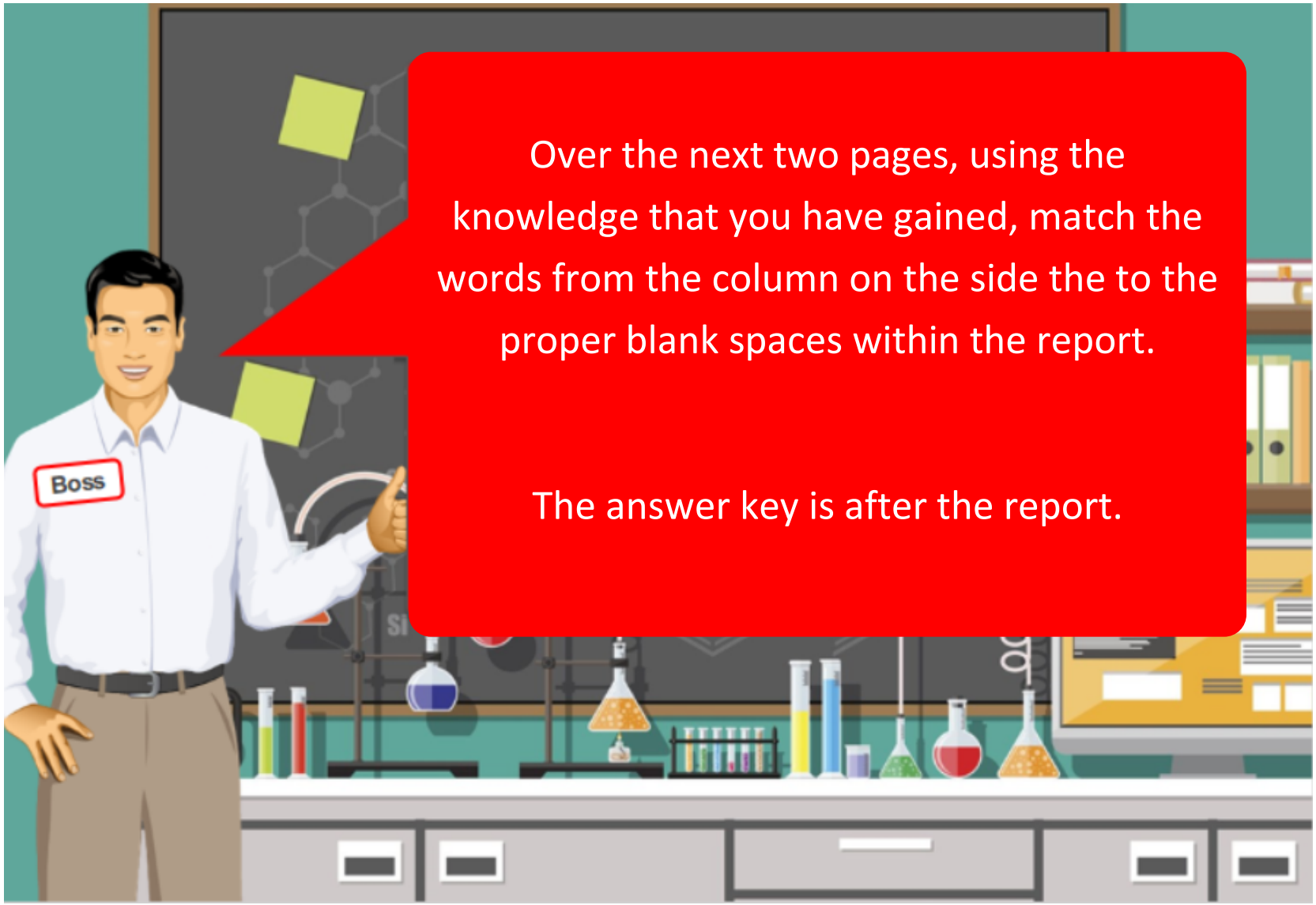
In order to demonstrate why we need another pond or wetland site, we must show how well these green spaces clean the water. In the report we will explain how the water quality could be improved and how water quality can be improved.
Boss



SAIT YOUNG ORIGINALS

SAITCity

Recommendations for Improving Chinook River Water Quality at Storm Drain Output

Background

The Chinook River is the heart of SAITCity. It increases our quality of life by providing opportunities and is an important source of water to SAITCity and several communities downstream.

Unfortunately, most stormwater in SAITCity drains directly into the Chinook River. Therefore, when it rains, many pollutants on the , sidewalks, and lawns are washed down the into the river.

In order to reduce the pollutants entering the river, SAITCity is monitoring how effective the stormwater pond and wetland are at cleaning water before it returns to the Chinook River.

Storm Drains

Recreational

Drinking

Street

SAITCity

Results

pH

phosphorus

turbidity

pond

wetland

SAITCity recently build one wetland and one pond that are cleaning stormwater before it gets returned to the river. The following results have been observed over the last 6 weeks of monitoring 3 locations in the city:

There is a large reduction in fertilizers entering the river in the form of _____ and sediment entering the river, measured by _____ in output drain samples leaving the wetland and pond compared to a regular storm drain. To neutralize _____ levels, the _____ does a better job than the _____.

In conclusion, the wetland shows a greater improvement in water quality in output drains entering the Chinook River compared to the pond.

ANSWER

SAITCity

Recommendations for Improving Chinook River Water Quality at Storm Drain Output

Background

The Chinook River is the heart of SAITCity. It increases our quality of life by providing Recreational opportunities and is an important source of Drinking water to SAITCity and several communities downstream.

Unfortunately, most stormwater in SAITCity drains directly into the Chinook River. Therefore, when it rains, many pollutants on the Street sidewalks, and lawns are washed down the Storm Drains into the river.

In order to reduce the pollutants entering the river, SAITCity is monitoring how effective the stormwater pond and wetland are at cleaning water before it returns to the Chinook River.

ANSWER

SAITCity

Results

SAITCity recently build one wetland and one pond that are cleaning stormwater before it gets returned to the river. The following results have been observed over the last 6 weeks of monitoring 3 locations in the city:

There is a large reduction in fertilizers entering the river in the form of phosphorus and sediment entering the river, measured by turbidity in output drain samples leaving the wetland and pond compared to a regular storm drain. To neutralize pH levels, the wetland does a better job than the pond.

In conclusion, the wetland shows a greater improvement in water quality in output drains entering the Chinook River compared to the pond.

For information on the SAIT program connected to this activity, please visit:

https://www.sait.ca/programs-and-courses/full-time-studies/diplomas/environmental-technology