MICROPLASTICS, WATERWAYS AND YOU

WHAT KINDS OF POLLUTION ARE THERE?

Activity #1 (7-10 minutes)

- ✓ Break students into groups of 3-5
 - Discuss and document (on a piece of lined paper) all pollution types you can think of.
 - ✓ What are the types of environments where you can find pollution?
- ✓ After 7-10 minutes, you will select a reporter from the group to share your talking points with the rest of the class.

MAJOR CATEGORIES OF POLLUTION







WE WILL DISCUSS MICROPLASTICS POLLUTION IN FRESHWATER ECOSYSTEMS!

TYPES OF WATER POLLUTION

Groundwater pollution

Marine pollution





SOURCES OF WATER POLLUTION

Point source pollution



From specific "point" sources

Non-point source pollution



From everywhere!

WHERE DOES PLASTIC POLLUTION COME FROM?

Activity #2 (5 minutes)

- ✓ Return students into their previous groups of 3-5
 - ✓ Discuss and document (on a piece of lined paper) what types of pollution sources are responsible for plastic pollution in ground and surface water.
- ✓ After 5 minutes of discussion, you will select a "different" reporter from the group to share your talking points with the rest of the class.

HOW DO YOU RELATE TO PLASTIC?

Activity #3 (7-10 minutes)

- ✓ Return students into their previous groups of 3-5
 - ✓ What types of water pollution feature microplastics?
 - ✓ Discuss how you use plastics in your everyday lives.
 - ✓ What are 3 things are made of plastic that you regularly use?
 - ✓ Are these items disposable?
 - ✓ What happens with these plastic items when you are done using them?
- ✓ After 7-10 minutes of discussion, you will select a "different" reporter from the group to share your talking point with the rest of the class.

PLASTIC AND HUMANKIND

Production items

- ✓ Technology
- ✓ Beverage/food containers
- Construction materials
- ✓ Fabrics
- Beauty supply products
- **Plastics processing**
- ✓ It takes plastic to make plastic
 - ✓ Polypropylene



WHAT ARE MICROPLASTICS?

 Microplastics are plastic particles that are smaller than 5mm in length and or width

How do plastics



become microplastics?



TYPES OF MICROPLASTICS

- Primary microplastics manufactured as microplastics. It is possible that they can pass through filters used to filter sewage. No wastewater treatment plans currently in place to deal with them.
 - Microbeads used in personal care products. Used to exfoliate/scrub off dead skin.
 - Nurdles pre-production pellets that are melted and formed together into any shape.
 - Fibers cloth and fabric such as nylon. A single wash can release up to 700,000 fibres.
- Secondary microplastics formed by larger plastics breaking down, Large plastic pieces are eroded into smaller and smaller fragments.
 - Plastic fragments smaller pieces of plastic that were broken down from "parent" pieces. They never go away, just get smaller and smaller.

HOW DO YOU RELATE TO PLASTIC?

Activity #4 (5 minutes)

- Students return to their group and discuss possible forces that can break plastics down. How long does it take for a plastic item item to break down in its environment?
 - ✓ What takes longer to break down...
 - ✓ Plastic bag?
 - ✓ Plastic bottle?
 - ✓ Straw?
 - ✓ Fishing line?

HOW DO SECONDARY MICROPLASTICS BREAK DOWN?



HOW LONG DOES IT TAKE SECONDARY MICROPLASTICS TO BREAK DOWN?



WHERE CAN WE FIND MICROPLASTICS?

Everywhere and all around us!!

- ✓ Abundant in aquatic systems.
 - ✓ Marine systems
 - ✓ Freshwater systems
- ✓ Drinking water
 - ✓ Bottle and tap -
- ✓ Food and drinks
- ✓ Wildlife and us! –



ECOLOGICAL AND HUMAN IMPACTS OF MICROPLASTICS

✓ We do not yet know the long-term impacts of microplastics pollution, but...

- Microplastics can be consumed by aquatic organisms and enter the food chain
 - ✓Insects
 - √Fish
 - √Humans
- It has been shown that plastic pollution can inflame the gut microbiome of aquatic organisms
 - ✓ More study is needed

WHAT CAN WE DO TO REDUCE PLASTIC USAGE IN OUR DAILY LIVES?

Activity #5 (5 minutes)

 Students will return to their groups and brainstorm about ways that they (and their families) can reduce plastic usage and microplastic pollution in their own lives.

ECOLOGICAL AND HUMAN IMPACTS OF MICROPLASTICS

Many examples

- ✓ Avoid using plastic disposables and single-use plastics
- ✓ Use those items only if they are really necessary
- ✓ Use reusable bags, bottles, and containers whenever possible
- ✓ Recycle plastics
- Clean up: don't leave waste in the environment
- Be careful about choosing products that contain or produce microplastics
- ✓ Avoid synthetic clothing, use a laundry filter, or wash less frequently

QUESTIONS?