

BECOME A
WASTE
HERO

REDUCE TO ZERO



Linear vs Circular Life Cycle


Level 4 Beginner Lesson



Lesson Prep & Curriculum Alignment

Prep time: 10 – 15 minutes

Students will understand the differences between the linear and circular economies and how products and materials move through a life cycle. They will develop the ability to think about the full life of the things that we use in our daily lives and set the groundwork for being able to redesign systems. Everyday objects are fascinating in their complexity, and this helps us conceptualize the way the linear system works and how to start making the products we use more circular.

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- 1** Display the lesson slides for the class and create a discussion about what they already know about the linear vs circular economies and introduce the concept of product lifecycle mapping. Ask students the guiding questions in the PowerPoint slide notes.
 - 2** **Print out the 4 handouts:** 1. Product Cards 2. Product Lifecycle Map 3. Circular Lifecycle Map 4. Example Lifecycle Map
 - 3** **Follow the steps on the next slide** and in the teacher notes in slides 17 and 20 to conduct the class activity

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Key Learning Outcomes and Curriculum Alignment:

- **Science - Earth and Human Activity:** Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. Things that people do can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things.
- **English Language Arts and Literacy:** Participate in collaborative conversations with diverse partners about topics and texts. Follow agreed-upon rules for discussions. Use words and phrases acquired through conversations, reading and being read to, and responding to texts. Participate in collaborative discussion in groups with diverse partners on topics and issues, expressing ideas clearly.
- **Social Studies - People, Places, and Environments:** The study of people, places, and environments enables us to understand the relationship between human populations and the physical world.

SDG Alignment



Flexible and adaptive lesson

Lesson plans are designed to be flexible and responsive to the evolving needs of your classroom. Lessons are editable and customizable to meet the different individual student and classroom contexts. A PowerPoint version with teacher instructions and a printable PDF lesson are available for download.

The Lesson

Lesson duration: 45 - 60 minutes

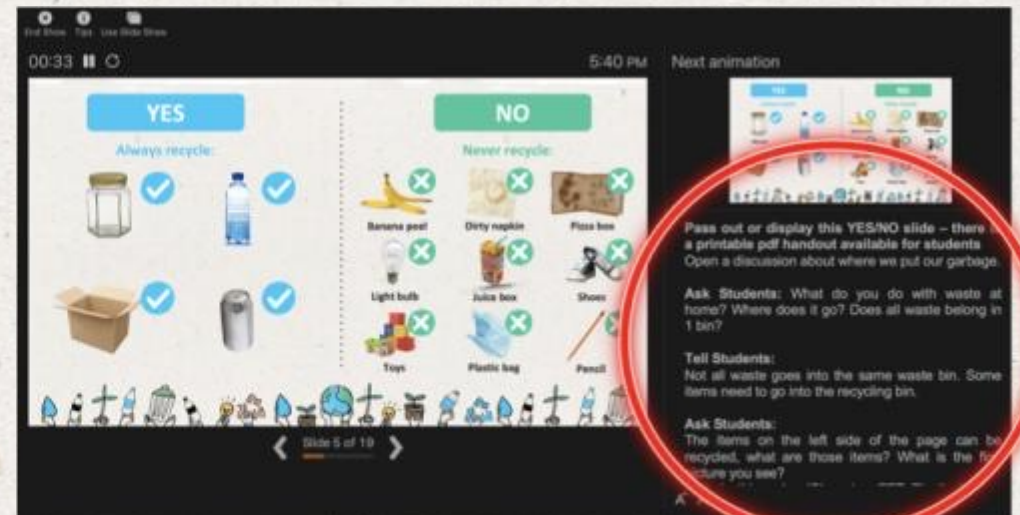
- 1** **Organize into groups of 3-5** and choose a product card from the deck or use any product the group knows a little about.
- 2** Each group has a large piece of paper or uses the **lifecycle map handout** provided and lists the 5 different life cycle stages: 1. Material extraction; 2. Production; 3. Distribution; 4. Usage; 5. Disposal.
- 3** Each group will **document with sticky notes** (some will draw pictures, others write lists) the entire life cycle of the product, from start to finish. Groups can use the completed handout of the soft drink bottle as an example. There should be a time limit of 20 minutes.
- 4** **Start your life cycle map** with the list of materials used to make the product and find out how they are extracted and processed. When consumers buy it how many times do they use it? Use the Internet to research this or have the students make some good guesses. When you get to the end-of-life, think **through** all the possibilities such as landfill, littering and recycling. Think critically about where the item will likely end up.
- 5** Lastly, **identify one or more circular opportunities** for this product. Could this product be reused in some way? Can it be recycled, if so, what can it be recycled into? What would you change about this product to allow it to be more circular?

Prepare the PowerPoint presentation

When you are ready to present the lessons to your class click on **Slide Show** on the top menu bar then select **Presenter View**. In Presenter view, you can see your notes as you present while the audience see only your slides.



The notes appear in a pane on the right. The text should wrap automatically, and a vertical scroll bar appears if necessary. You can also change the size of the text in the Notes pane by using the two buttons at the lower left corner of the Notes pane.



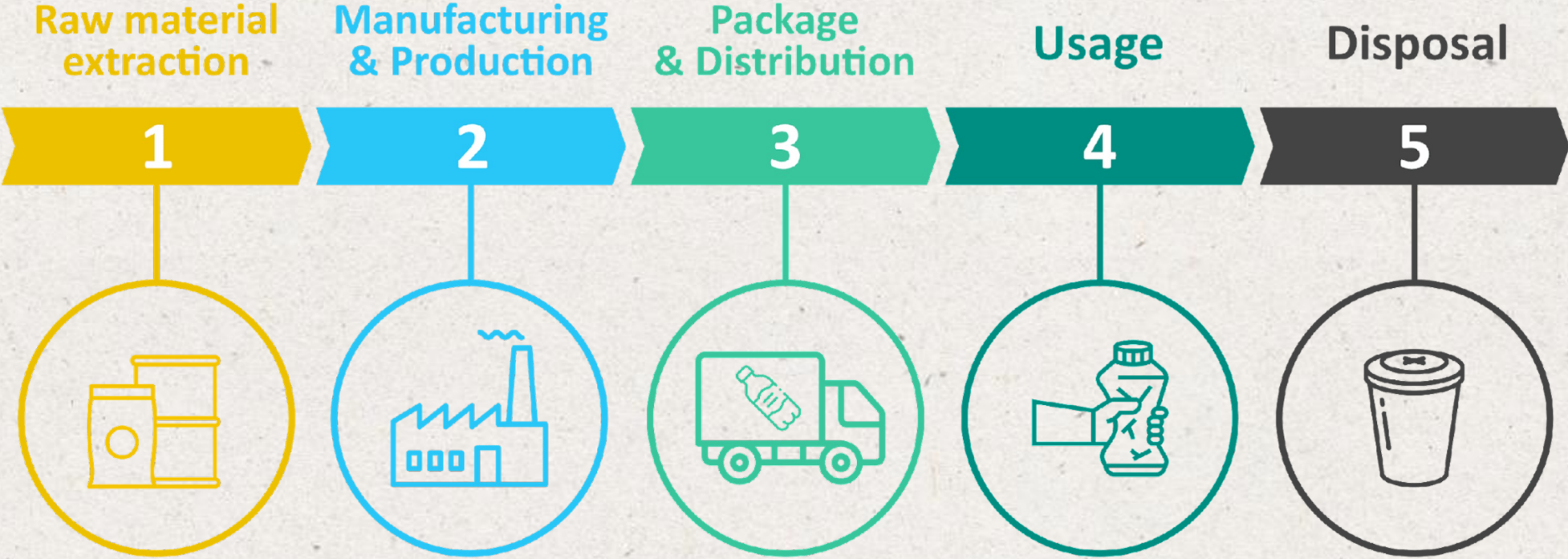
Linear Economy

VS

Circular Economy



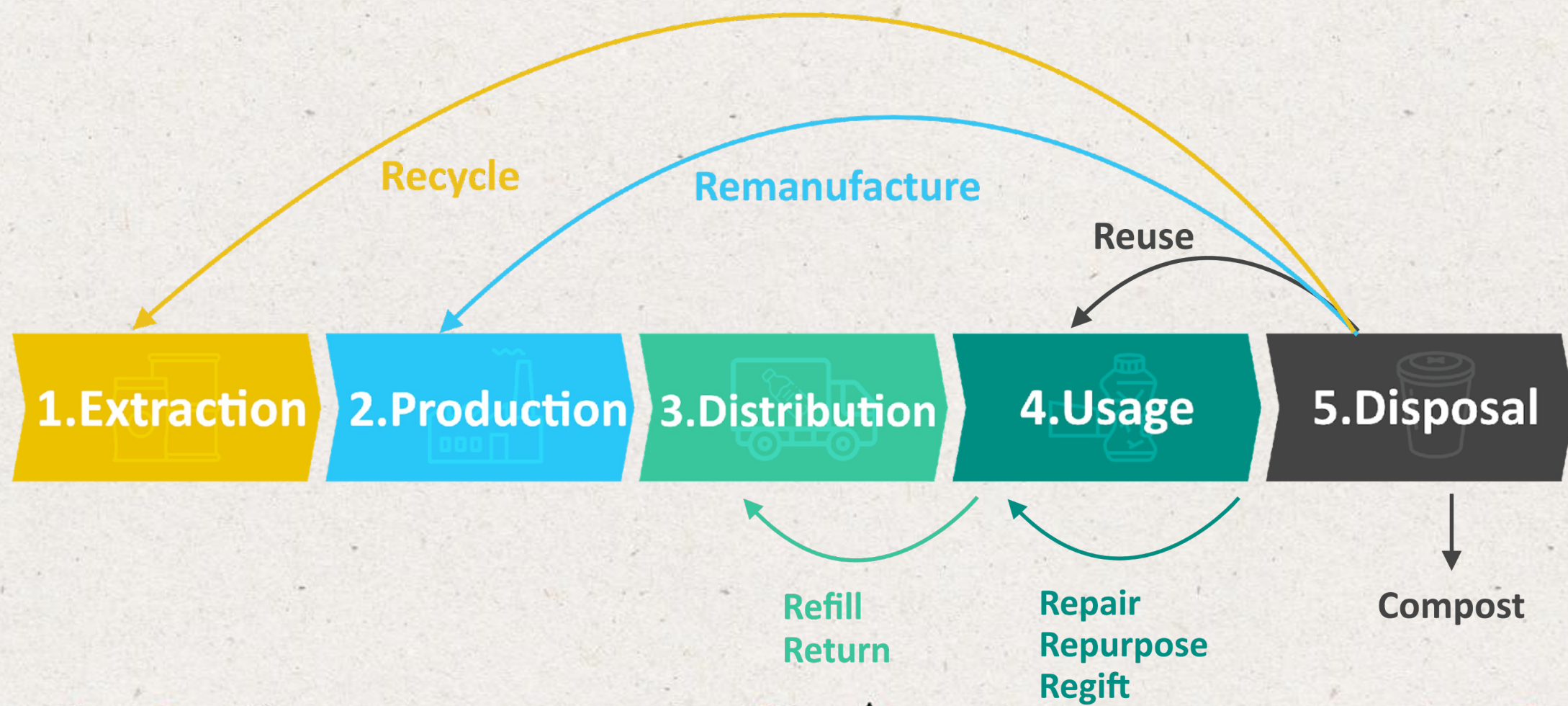
Linear Economy



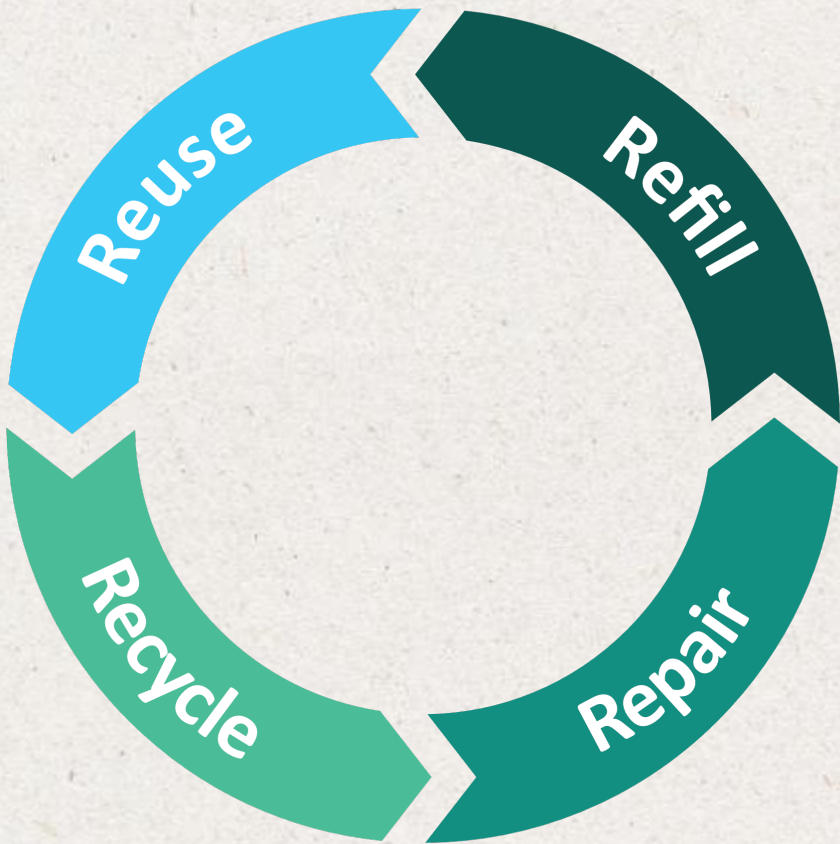
Circular Economy



Life Cycle Mapping



Circular products can end up in linear systems



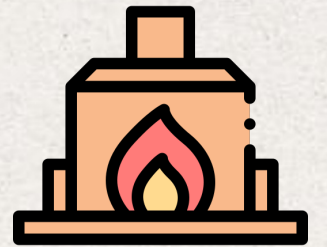
Mismanaged
Waste



Landfill



Nature



Incinerator



Where does your
waste go if you
do not recycle?



Where does our waste go?

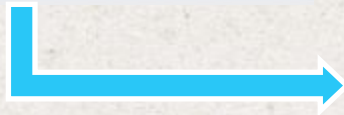


Most of our garbage goes to local landfills

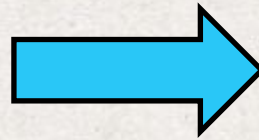
- Landfills hold layers of different kinds of waste, but some of this waste does not belong here and will take hundreds of years to disappear.
- Landfills bring hazards such as **odor, smoke, noise, bugs, and water supply contamination.**



Where does our waste go?



1. People leave waste on the ground or it falls from a trash bin.



2. When it rains waste flows into storm drains.



3. The storm drain feeds into local waterways.



4. Those waterways then feed into local rivers.



5. Rivers flow into the ocean.



6. Ocean currents send waste around the world and create "waste islands".



Class Activity: Life Cycle Map

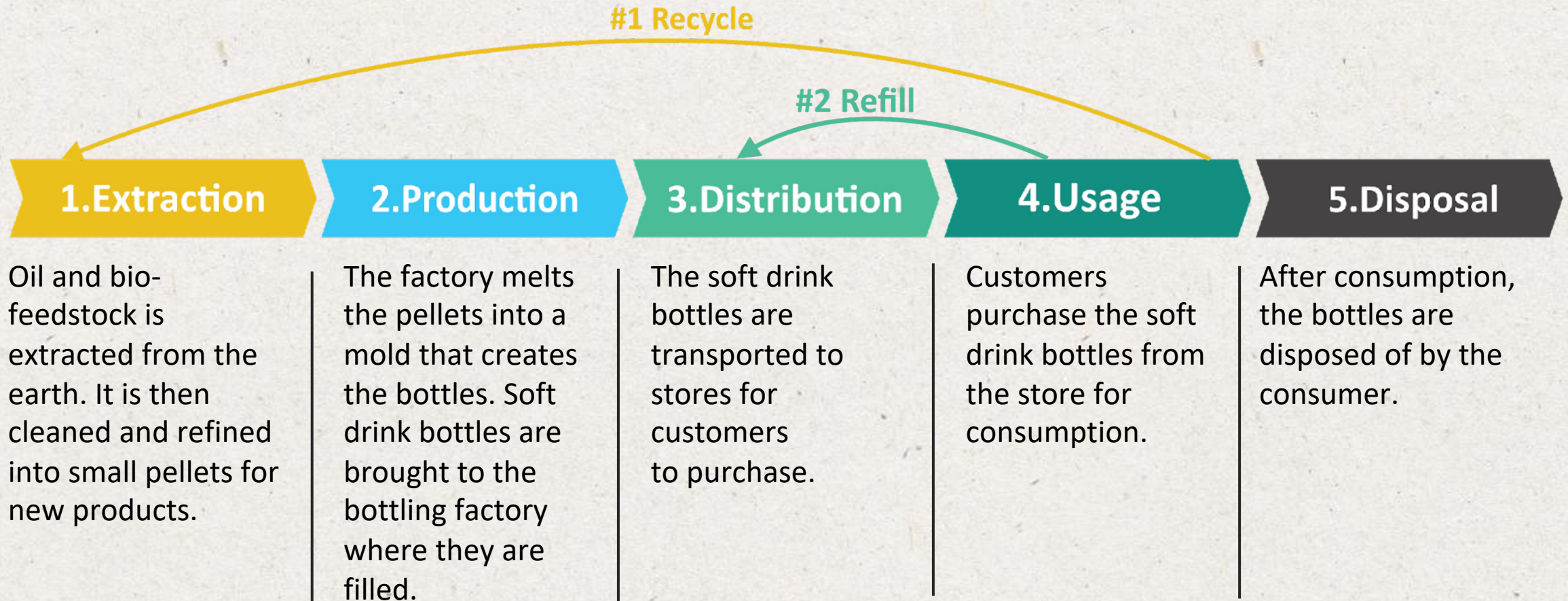
Group: _____

Product: _____



Opportunities for Circularity





Opportunities for Circularity

#1 Recycle to make new bottles or yarn.

#2 Use the old bottle at a refill station for your shampoo or bath soap.



Running shoes



Car tires



**Wooden
bed frame**



Cell phone



Cotton t-shirt



Food packaging



Next Steps

Step 1: Organize into **groups of 3-5** and choose a product card from the deck or any product your group knows a little about. Give out each of the four handouts to each group.

Step 2: Each group has a large piece of paper or uses the handout provided and list the 5 different life cycle stages **1. Material extraction 2. Production 3. Distribution 4. Usage 5. Disposal**

Step 3: Each group will document with sticky notes (some will draw pictures, others write lists) the entire life cycle of the product, from start to finish.

Step 4: Use the lifecycle water bottle example as a key to help guide students.

Step 5: Lastly, identify one or more **circular opportunities** for this product.

When the groups complete their maps, everyone will share what was discovered about their product's life cycle.

***Teachers may want to display or print out the example plastic bottle life cycle map while students are doing the exercise.**

