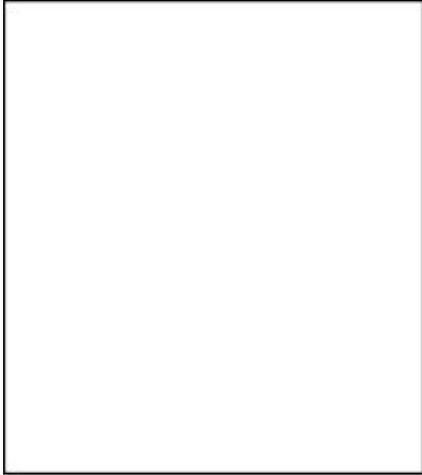


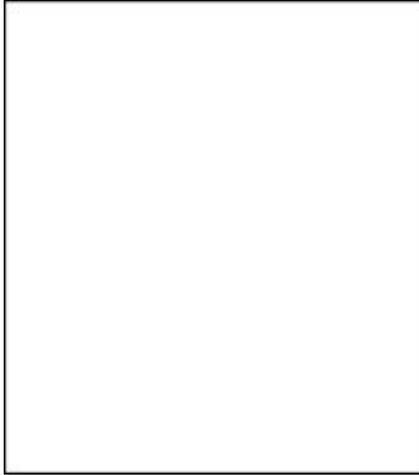
# Station 1

Part one: the making of jeans

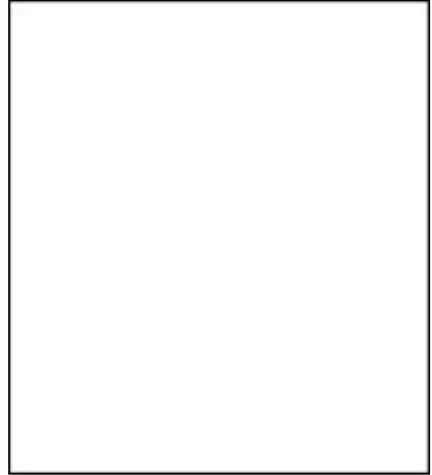
1.



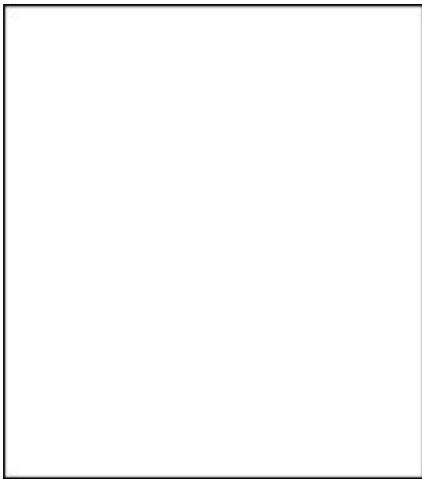
2.



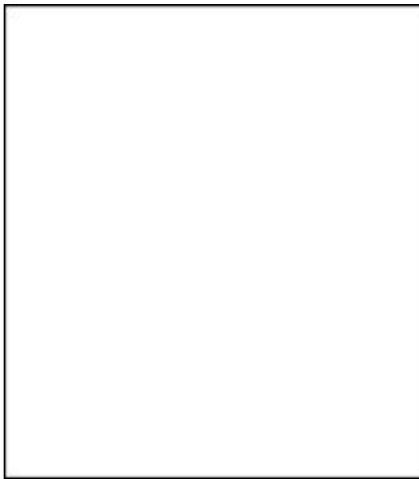
3.



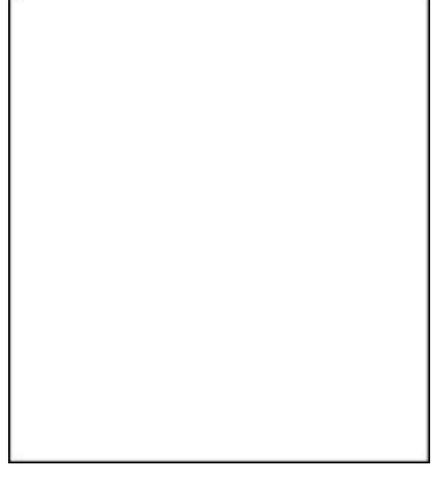
4.



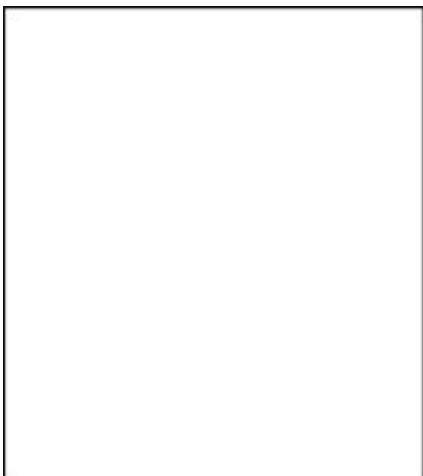
5.



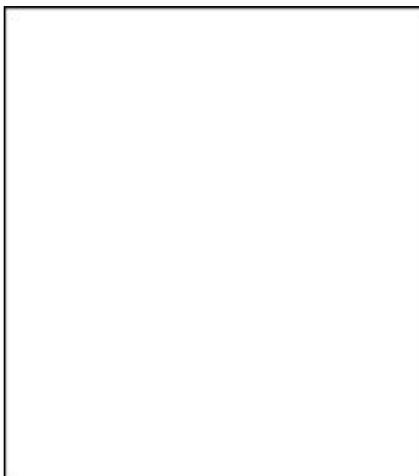
6.



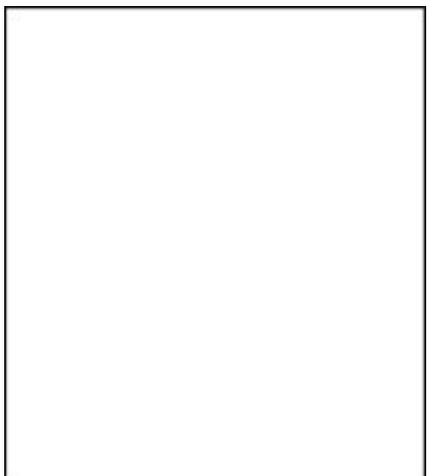
7.



8.



9.



# Station 1

## Part two: tie-dye activity

TAPE YOUR LITMUS PAPER HERE

1. What is the pH of the water? (Record the number) \_\_\_\_\_
2. What is the pH of the dye solution? \_\_\_\_\_  
a. Is the dye solution acidic or basic? How do you know? \_\_\_\_\_

TAPE YOUR LITMUS PAPER HERE

3. How many carbon, nitrogen, chlorine, hydrogen, oxygen atoms are in the dye molecule?

Carbon (C) \_\_\_\_\_

Nitrogen (N) \_\_\_\_\_

Chlorine (Cl) \_\_\_\_\_

Hydrogen (H) \_\_\_\_\_

Oxygen (O) \_\_\_\_\_

Carbon (C) \_\_\_\_\_

4. Predict how your cloth would look like after tie-dye treatment. Make a sketch below.



5. Record your observations during the tie-dye treatment process. Sketch and label the materials on the desk. Record the color, smell, texture, etc.



## Self-checklist

1. Did we test the pH of the water?  Yes  No
2. Did we test the pH of the dye solution **BEFORE** dying the white cloth?  Yes  No
3. Did we follow **ALL** steps of the tie-dye procedure?  Yes  No
4. Did we **LABEL** the baggie with the dyed cloth **INSIDE**?  Yes  No
5. Did we record **ALL** my observations onto my worksheet?  Yes  No
6. Did we place all “Making of Jeans” cards back into the envelope?  Yes  No

# Station 2

Part one: how does your shirt affect the environment?

1. Sketch the “State-of-the-Art” filtration system” in the space provided below.

2. Record your observations before and after you filter the River Water.

Water Before Filtration	Water After Filtration

3. Is the water clean after filtration?  Yes  No

a. If no, what is still in the water? \_\_\_\_\_

\_\_\_\_\_

Part two: fashion revolution trailer

1. What is dye effluent?

---

---

---

---

2. What is causing this dye effluent?

---

---

---

3. Why is the dye effluent a concern?

---

---

---

4. What have some people do to solve this problem?

---

---

---

---

5. Why is it important to preserve the water?

---

---

---

---

### Self-checklist

1. Did we sketch the filtration system?  Yes  No
2. Did we record our observations before and after water filtration?  Yes  No
3. Did we pour the filtered water back into the “River Water” bucket?  Yes  No
4. Did we watch the Fashion Revolution video?  Yes  No
5. Did we answer **ALL** questions related to the video?  Yes  No
6. Did we understand each question about the video?  Yes  No
  - a. If no, which question(s) are you confused on? \_\_\_\_\_

# Station 3

## Part one: How much is wasted?

1. Write down 3 new facts you learned from the graph titled “A Profile of NYC’s Residential Waste Stream”

- a. \_\_\_\_\_  
\_\_\_\_\_
- b. \_\_\_\_\_  
\_\_\_\_\_
- c. \_\_\_\_\_  
\_\_\_\_\_

2. What type of waste should each item be classified as?

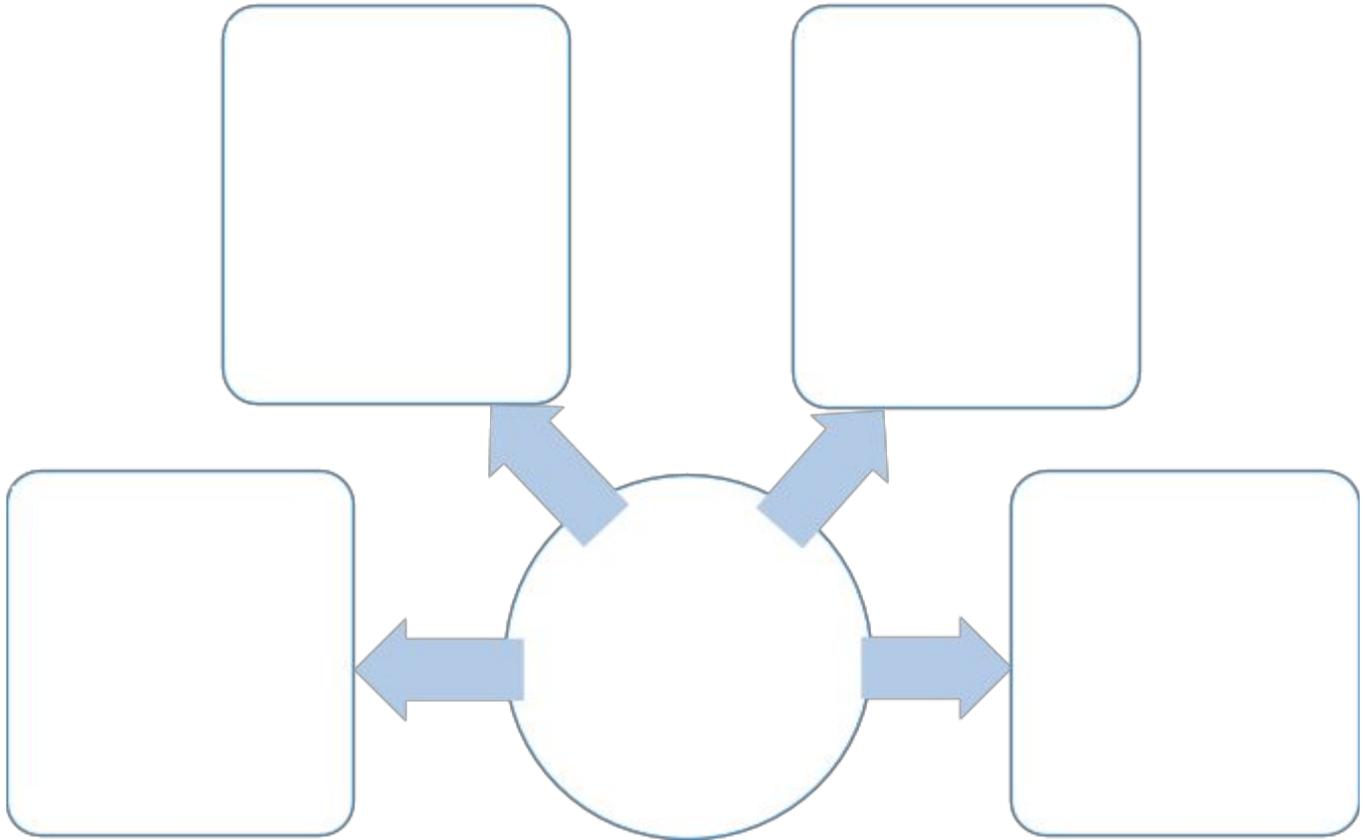
Rigid Plastics 	Textiles 	Household Hazardous Waste 
Food Waste 	Paper 	Electronic Waste 

3. Which of these wastes can be recycled? \_\_\_\_\_  
\_\_\_\_\_

# Station 3

Part two: NYC Department of Sanitation video

Complete the graphic organizer below:



## Self-checklist

1. Did we understand the graph in Part One of this station?  Yes  No
2. Did we classify all the items in the WASTE envelope?  Yes  No
  - a. If not, which one(s) are you not sure of? \_\_\_\_\_
3. Did we watch the video on the NYC Department of Sanitation?  Yes  No
4. Did we fill out the graphic organizer?  Yes  No
5. Did we place all the waste items back into the WASTE envelope?  Yes  No

# STATION 4

## PART ONE: FIBERS INSPIRED BY COTTON CANDY

1) Describe the phase change as the cotton candy is made. (liquid, solid, or gas)

---

---

---

2) How is the making of cotton candy similar to the making of nano-fibers using force spinning?

---

---

---

---

3) How is a micrometer different from a nanometer?

---

---

---

4) Vocab Match-up: Match the correct definitions to the vocabulary terms in Column A.

### Column A

1. Sucrose \_\_\_\_\_
2. Millimeter \_\_\_\_\_
3. Nanometer \_\_\_\_\_
4. Polymer \_\_\_\_\_
5. Diameter \_\_\_\_\_
6. Micrometer \_\_\_\_\_
7. Force-spinning \_\_\_\_\_

### Column B

- A. A straight line passing through the center of a circle or object.
- B. A chemical compound made up of repeating subunits bonded together.
- C. A method of making fibers using a spinning polymer jet.
- D. The scientific name of sugar
- E. One millionth of a meter (0.000001 m)
- F. One billionth of a meter (0.000000001 m)
- G. One thousandth of a meter (0.001 m)

- 5) Take a small piece of cotton candy to observe under the microscope. Make your observation in the space provided below.



part two: fibers under the scope

- 1) Observations
  - a) Sketch it
  - b) Morphology (smooth, rough, scaly, thin, thick, etc...)
  - c) What does it remind you of?
  - d) What color is the fiber?
  - e) Measure the size of diameter of each fiber, in terms of micrometer

**Hint: 1 centimeter = 10,000 micrometers**

<u>Image 1</u>	<u>Image 2</u>	<u>Image 3</u>	<u>Image 4</u>	<u>Image 5</u>
<u>Sketch</u>	<u>Sketch</u>	<u>Sketch</u>	<u>Sketch</u>	<u>Sketch</u>
<u>Morphology</u>	<u>Morphology</u>	<u>Morphology</u>	<u>Morphology</u>	<u>Morphology</u>
<u>Color</u>	<u>Color</u>	<u>Color</u>	<u>Color</u>	<u>Color</u>
<u>Diameter</u>	<u>Diameter</u>	<u>Diameter</u>	<u>Diameter</u>	<u>Diameter</u>

2) Which image do you think is the cotton candy fibers? Use your observations to explain your answer.

---

---

---

---

3) Which image do you think is the human hair? Use your observations to explain your answer.

---

---

---

### Self-checklist

1. Did we read about how electrospinning works?  Yes  No
2. Did we answer **ALL** the questions about how electrospinning works?  Yes  No
3. Did we observe cotton candy fibers under the microscope?  Yes  No
4. Did we make observations about each type of fiber in Part Two?  Yes  No
5. Did we measure the diameters of each type of fiber?  Yes  No
6. Did we include the correct units when measure the diameters of the fibers?  Yes  No
7. Did we clean up our work area?  Yes  No

# Station 5

## Part one: How do enzymes work?

1. What do enzymes do in our bodies?

---

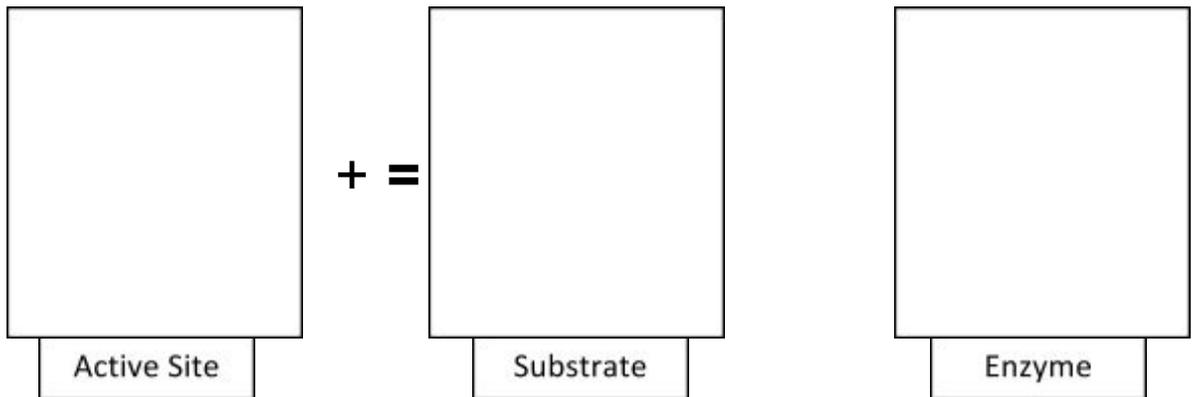
---

2. What are the two parts of an enzyme?

---

---

3. Match the proper substrate into the active site and sketch the molecules below:



## Part two: how can enzymes help?

1. Using the images in Figure 2, what or who may be most affected by pollution produced by these textile factories?

---

---

---

2. How do you think this will affect the environment?

---

---

---

3. How do you think this will affect people who do NOT live near these environments?

---

---

---

---

4. What is bioremediation?

---

---

---

Part three (optional): enzyme action

1. Describe, sketch, and label what you see in the space provided below:

<p style="text-align: center;"><u>Apple Half #1</u></p>	<p style="text-align: center;"><u>Apple Half #2</u></p>
---	---

2. If ALL living things have enzymes, what do you think caused the apples to brown or not to brown?

---

---

---

## Self-checklist

1. Did we read and understand how enzymes work?  Yes  No  
a. If not, what are you not sure of?
- 

2. Do we know what enzymes are used for?  Yes  No

3. Did we put all the Lego models back to their original places?  Yes  No

4. Did we complete Part One **AND** Part Two of this station?  Yes  No