

# DIY Robot Hands

## Biomechanics Exploring Robotics through STEAM

Grade Level: Elementary

### Objective:

- Spark students' imagination by creating DIY Robot Hands using paper, straws, and string.
- Encourage students' engineering and creative thinking skills through hands-on learning.
- Introduce students to the world of robotics and its connection to arts and technology.

### Materials:

- Standard Drinking Straws
- Jumbo-Sized Straws
- Construction Paper
- Scissors
- Pencils/Crayons
- String
- Double Sided Tape



Protocol:

1. Hand Tracing and Cutting
  - a. Get two pieces of construction paper and crayons.
  - b. Trace your hand onto the construction paper.
  - c. Cut out the hand outline using scissors.
  - d. Once the hand outline is cut, mark the location of joints.
  - e. Fold the paper hand at the marked joint locations.
2. Adding Straws
  - a. Grab your different colored drinking straws and jumbo-sized straws.
  - b. Cut the standard straws into different sizes -  $\frac{1}{4}$ ",  $\frac{1}{2}$ ", 1", and  $2\frac{1}{4}$ ".
  - c. Tape the standard straws onto the hand at the marked joint locations.
    - i. *These will act as the fingers.*
  - d. Tape the jumbo-sized straw onto the wrist, which will be the base of the hand.
3. Adding Yarn or String
  - a. Grab your yarn or string.
  - b. Cut five strands of yarn or string, each approximately 2 feet long.
    - i. *Remember to knot one end of each strand onto the cut straw being placed on each finger tip.*
  - c. Thread the knotted strand through each finger.
  - d. Have all of the yarn or string meet at the wrist.
4. Exploration and Experimentation.
  - a. Pull on the strings individually and in combination to explore the movement and flexibility of your DIY Robot Hands.
  - b. Observe and discuss the different ways the robot hands can be manipulated.
  - c. Make adjustments or modifications to your robot hand to improve functionality and movement if needed.

Worksheet:

Find more activities on [www.xplorstem.com](http://www.xplorstem.com)

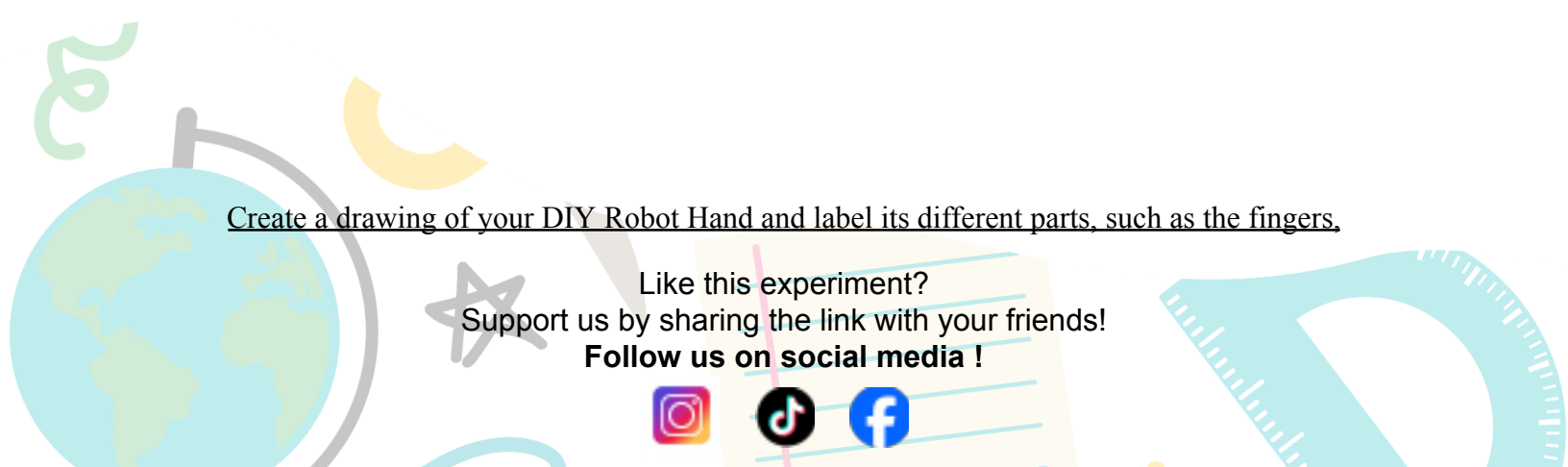
Title: DIY Robot Hand Reflection

Instructions: Answer the following questions based on your experience creating and experimenting with your DIY Robot Hand.

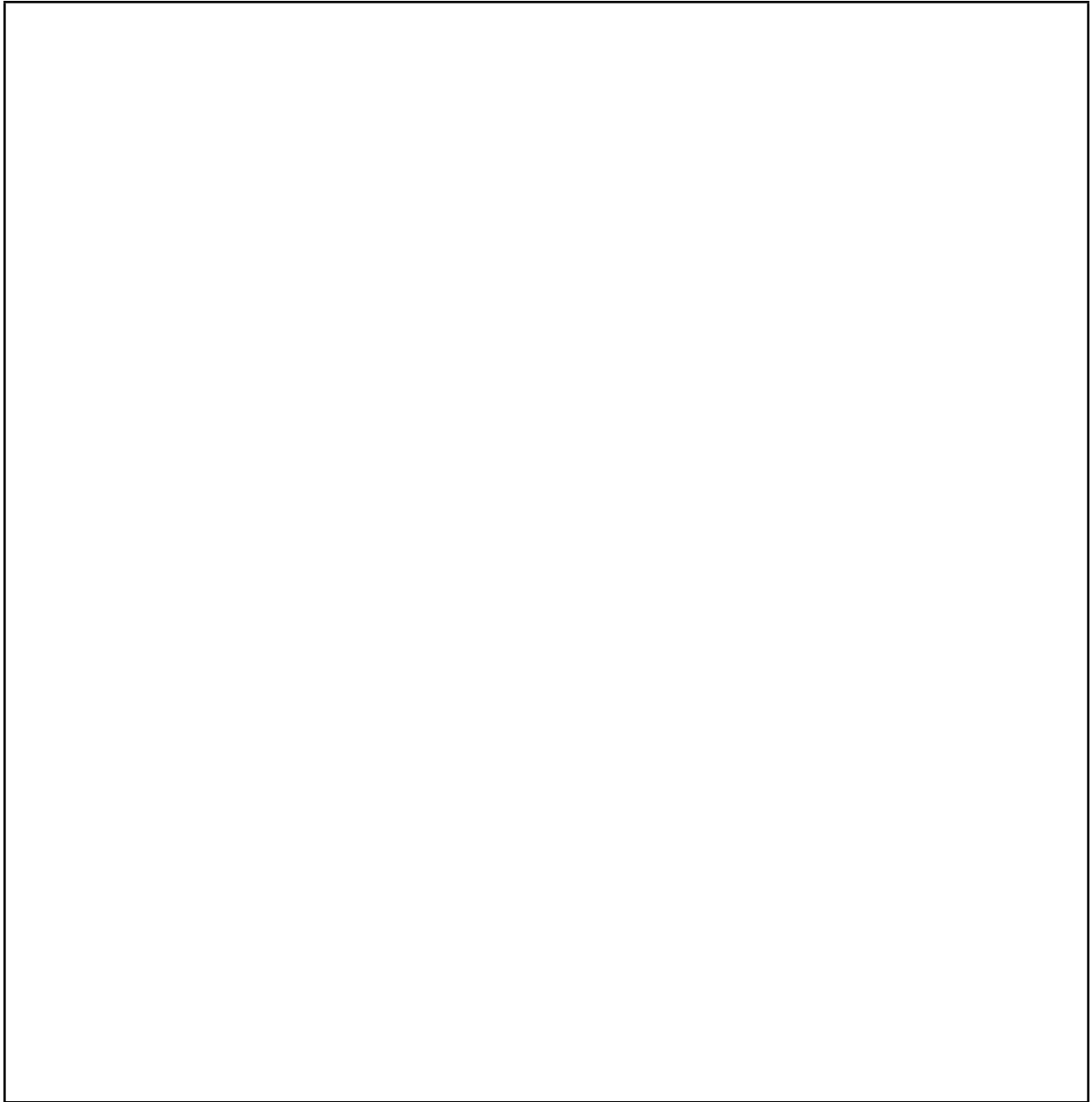
1. What did you enjoy most about creating your DIY Robot Hand?
3. Why do you think engineering and creative thinking are important in making robots?
4. What did you learn about robotics through this activity?
6. What improvements or modifications would you make to your robot hand if you had more time?

Create a drawing of your DIY Robot Hand and label its different parts, such as the fingers.

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straws, and string.



\_\_\_\_\_ (your name) **ROBOT HAND**

