**Rotary Encoders & Human-Computer Interaction —
Results and Analysis Worksheet – ANSWERS**

1. In your experimentation with the LEGO rotary encoder, did your predicted angles match up with the computer angles? Do you think the numbers should match up? Explain.

**No, the angles did not match up. Yes the numbers should match in theory. The angles only increase by 6 degrees in the program.**

1. After graphing pixels vs. length from your experiments, what is the relation between the amount of pixels moved on the screen for a given length traveled on paper?

**The relation is linear and about 350 pixels on screen per inch on paper.**

1. Explain what a rotary encoder is.

**A rotary encoder is an electro-mechanical device that converts the angular motion of an axle to an analog or digital code.**

1. List some examples of devices that have rotary encoders: **elevators, robots, wheelchairs**
2. Briefly explain how a rotary encoder works.

**The rotary encoder uses two color sensors and a patterned wheel to translate angular motion to a digital code.**

1. Did the robotics (LEGO EV3) setup help you better understand a rotary encoder? Explain your answer.

**Yes, it was helpful to use a physical model.**

1. How familiar are you with the topic of angles, after this activity? Rate from 1 (not familiar) to 10 (very familiar): **10**
2. What do you think is the angle shown in each picture? (Write the answer in degrees)



**135**

**270**

**0 or 360**

**45**

**90**

1. Would the rotary encoder work for any other shapes, such as a square?

**No, a square would cause some problems, such as uneven slits, weak encasing cover due to shape, or might not even register on the encoder depending on the slit location.**

1. How do you think rotary encoders are applied in elevators and fans? (Hint: Rotary encoders were used to relate rotation to distance in the computer mouse and rotation to angles in the LEGO device.)

**An elevator regulates the distance of the elevator box as the motor turns. A fan can regulate the speed of the blades with an encoder.**