



Video Title: A New Class of Soft Robots Inspired by Origami

Activity Vocabulary: Define each word and then use it in a sentence.

- Soft Robots:
- Rigid Bodies:
- Uncertain Environment:

Reflection Questions:

- *Why do soft robots have advantages in uncertain environments?*
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- *What are the current disadvantages to soft robots?*
o
- *How WPI is using origami folding techniques to create new abilities for soft robots?*
o
- *Can you explain how soft robots can be used for disaster response?*
o
- *What other applications can soft robots be used for besides disaster response?*
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Answer Sheet:

Video Title: A New Class of Soft Robots Inspired by Origami

Activity Vocabulary: Define each word and then use it in a sentence.

- Soft Robots: *made of soft materials, robots that deform.*
- Rigid Bodies: *traditional robots are made of rigid bodies (does not deform or change shape) and cannot adapt to uncertainties in the environment.*
- Uncertain Environment: *when conditions are constantly changing within a business environment. As a result, management has little influence over factors that are outside of the company's control.*

Reflection Questions:

- *Why do soft robots have advantages in uncertain environments?*
 - *Instead of having articulated joints they deform continuously along their length which makes them able to take impact, absorb energy in terms of a collision.*
- *What are the current disadvantages to soft robots?*
 - *They are not strong, cannot carry a lot of weight, deform under a load*
- *How WPI is using origami folding techniques to create new abilities for soft robots?*
 - *Using repeating patterns of folding. When you create these repeating patterns, you can generate some interesting mechanical behaviors one of which is having stiffness in some directions and softness in some other directions.*
- *Can you explain how soft robots can be used for disaster response?*
 - *We cannot really put rigid mobile robots under rubble or navigate through some complex passageways. A snake-like robot that is really narrow and slender in the cross-section can really go into these narrow holes and navigate through and find survivors in a search and rescue application.*
- *What other applications can soft robots be used for besides disaster response?*
 - *Answers may vary*