SN EDUCATOR GUIDE

October 28, 2017

Origami Outfits Help Bots Retool

Cross-Curricular Discussion: Q

Directions: The following list of discussion questions is provided to help you take notes, brainstorm ideas and test your thinking in order to be more actively engaged in class discussions related to this article. All questions in this section are related to topics covered in "Origami outfits help bots retool."

CHEMICAL SCIENCES

Discussion questions:

1. What is a polymer, and what are some examples of polymers in chemistry and biology?

2. What types of substances dissolve in water? Explain how water dissolves a substance.

3. Other than the molecular composition of a solute, what other conditions affect the solubility of a solute and solvent?

Extension prompts:

4. What is heat-shrink material made of, and how does it work?

PHYSICAL SCIENCES

Discussion questions:

1. What is magnetism? Why are some materials magnetic and other are not?

2. What is a solenoid?

Extension prompts:

3. How can a solenoid be used to move things?

4. How can a solenoid be used to make sparks?

BIOLOGICAL SCIENCES

Discussion questions:

1. How does an RNA polymerase enzyme adapt itself to make RNA copies of different DNA genes under different circumstances, essentially acting like a natural transformer or origami bot?

Extension prompts:

2. How do macrophage and mast cells, certain types of white blood cells in the immune system, adapt themselves to detect different intruders in your body?

3. How do complement proteins act like a swarm of self-assembling nano-robots?

ENGINEERING AND EXPERIMENTAL DESIGN

Discussion questions:

1. What improvements would you like to see made to the origami robot research?

Extension prompts:

2. What are some possible extensions and applications you can think of for remote-controlled magnetic manipulation?

3. What are some possible extensions and applications you can think of for the origami materials?

4. What are some possible extensions and applications you can think of for such robot research?