What is a Biomedical Engineer?

Draw and label a picture of a biomedical engineer at work.

Explain your drawing of a biomedical engineer:

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________
What is a Biomedical Engineer?

Draw a picture of a biomedical engineer at work. Label your picture.
What is a Biomedical Engineer?

1. Which of the following would a biomedical engineer do for his or her job? Mark ALL that apply:

- fix ambulance engines
- study how the human body works
- study how people’s feet work when they have trouble walking
- design a pair of eyeglasses
- study plants and animals
- fix machines in a hospital
- design a doctor’s office
- collect data about the human body
- design an artificial arm
- design robots that can help people get work done when they are sick

2. What kinds of problems do biomedical engineers work on?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
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- [ ] collect data about the human body
- [ ] design an artificial arm
- [ ] design robots that can help people get work done when they are sick
Which of these things is a model? Circle **ALL** the models below.

- map of hiking trails
- battery
- suit of armor
- microscope
- miniature bridge
- bicycle
- guitar
- plastic globe
- doll house

What is YOUR definition of the word “model”?

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________
Which of these things is a model? Circle **ALL** the models below.

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Directions: Decide whether each statement below is TRUE (😊 T) or FALSE (😢 F) and circle your answer.

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<td>😢</td>
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1. A girl is designing a new kind of brace to protect broken fingers. Which model would be MOST useful for her to use? Circle the BEST answer below.

   A. a model that bends like a real finger
   B. a model that looks exactly like a finger
   C. a model that feels soft like a real finger
   D. a model would not be useful here

2. A company is designing a new building. Describe 2 ways the workers at the company would use models. Write your answers below.

   (1)____________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________
   (2)____________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________
1. Decide whether each statement below is TRUE (😊 T) or FALSE (👎 F) and circle your answer.

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2. The picture shows a human skeleton. What does the skeleton do? Mark all that apply.

- ☐ helps the human body move
- ☐ keeps the human body warm
- ☐ protects the organs in the human body
- ☐ supports the human body

3. What part or parts of your body do you use to turn your wrist in a circle? Mark all that apply.

- ☐ bones
- ☐ a joint
- ☐ skin
- ☐ muscles
1. **Why are humans able to bend their legs? Circle the BEST answer.**

   A. Because their skin is soft.
   
   B. Because their legs are strong.
   
   C. Because their bones are flexible.
   
   D. Because they have joints in their knees.

2. **Where in their bodies do people have muscles? List 6 places below.**

   1. __________________________________________________
   
   2. __________________________________________________
   
   3. __________________________________________________
   
   4. __________________________________________________
   
   5. __________________________________________________
   
   6. __________________________________________________
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2. Where in their bodies do people have muscles? List 3 places below.
   1. ________________________________
   2. ________________________________
   3. ________________________________
A company wants your help designing a brace for elbows to keep them from moving while they heal.

1. List 2 questions you would need to ask.
   (1)_____________________________________________________
       ___________________________________________________
   (2)_____________________________________________________
       ___________________________________________________

2. List 2 properties that the material you choose for your brace should have.
   (1)_____________________________________________________
       ___________________________________________________
   (2)_____________________________________________________
       ___________________________________________________

3. Why are these properties important? _______________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

4. Sketch your design on the back of this page.
Sketch your elbow brace design in the box below. Label the parts.
A company wants your help designing a brace for elbows.

*Directions*: Design an elbow brace to keep an elbow from moving while it heals. You can sketch your ideas on the back of this page.

Draw your design plan in the box below. Label the parts.
**What is a Biomedical Engineer?**

Draw and label a picture of a biomedical engineer at work.

*A good picture would show someone working to solve problems related to biology or medicine.*

*Examples include: someone using or gathering data about the human body to design or improve technologies such as knee braces, prosthetic limbs, or pacemakers.*

Explain your drawing of a biomedical engineer:

*Answers will vary, but may include: Someone who uses what he or she knows about science, math, and the human body to solve problems related to biology or medicine.*
What is a Biomedical Engineer?

Draw a picture of a biomedical engineer at work. Label your picture.

A good picture would show someone working to solve problems related to biology or medicine.

Examples include: someone using or gathering data about the human body to design or improve technologies such as knee braces, prosthetic limbs, or pacemakers.
What is a Biomedical Engineer?

1. Which of the following would a biomedical engineer do for his or her job? Mark ALL that apply:

- [ ] fix ambulance engines
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- [ ] study plants and animals
- [ ] fix machines in a hospital
- [ ] design a doctor’s office
- [X] collect data about the human body
- [X] design an artificial arm
- [ ] design robots that can help people get work done when they are sick

2. What kinds of problems do biomedical engineers work on?

*Biomedical engineers work on problems related to biology, the human body or medicine. Some examples include: developing artificial skin to help burn victims, developing instrumentation (such as MRIs and X-ray machines) to aid in the diagnosis of patient illness, etc.*
What is a Biomedical Engineer?

Which of the following would a biomedical engineer do for his or her job? Mark ALL that apply:

- [ ] fix ambulance engines
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- [ ] microscope
- [ ] miniature bridge
- [ ] bicycle
- [ ] guitar
- [ ] plastic globe
- [ ] doll house

What is YOUR definition of the word “model”?

*A model is a representation of an object, system, or phenomenon.*
Which of these things is a model? Circle **ALL** the models below.

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**Student Pre-Post Assessment**

Lesson 3

**Directions:** Decide whether each statement below is TRUE (😊 T) or FALSE (🙁 F) and circle your answer.

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Answers will vary, but may include: to test the strength of their building design, to show other people how the building will look, to figure out what will happen to the building in an earthquake, etc.
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A company wants your help designing a brace for elbows to keep them from moving while they heal.

1. List 2 questions you would need to ask.

   Answers will vary, but may include: how does a healthy elbow function? Will the person have to put the brace on and remove it often? How long will the person need to wear the brace?

2. List 2 properties that the material you choose for your brace should have.

   Answers will vary, but may include: it should be strong/hard, not easy to bend, there should be a fastener that is easy to use (e.g. Velcro), etc.

3. Why are these properties important?

   Answers will vary, but may include: it needs to be hard enough that it will protect the elbow if something bumps into it, it should not be flexible because you want to keep the elbow from moving, it should be easy to put on and take off (e.g. Velcro), etc.

4. Sketch your design on the back of this page.
A good picture would show a brace that is shaped like a human elbow. Students should note that the brace keeps the elbow from moving. This may include indicating that the brace is hard or inflexible. Students may also show a method for putting on and taking off the brace (e.g. a Velcro fastener).
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