What is an Electrical Engineer?

Draw and label a picture of an electrical engineer at work.

Explain your drawing of an electrical engineer.

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________
What is an Electrical Engineer?

Draw a picture of an electrical engineer at work. Label your picture.
What is an Electrical Engineer?

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

- [ ] improve electrical circuits
- [ ] repair electrical appliances
- [ ] draw a circuit so others can build it
- [ ] connect wires to lights and switches in a house
- [ ] design the circuits in submarines
- [ ] build car engines
- [ ] design the shape of electric cars
- [ ] use insulators and conductors
- [ ] design electrical parts of machines
- [ ] know how to use electricity to make things work
- [ ] fix technologies that use electricity
When a light bulb is turned on, energy changes from one form to another.

1. At first, the energy enters the light bulb in what form?
   Circle the BEST answer.
   
   A. plug
   B. light
   C. darkness
   D. electricity

2. What form(s) does the energy change into?
   Check ALL that apply.
   
   ☐ light
   ☐ lamp
   ☐ light bulb
   ☐ electricity
   ☐ heat
Directions: For each question below, circle the BEST answer.

The picture below shows a glass of water being heated on a hot plate. Energy is changing from one form to another.

1. When the energy enters the hotplate, what form is it in?
   A. plug
   B. heat
   C. cold
   D. electricity

2. What form does the energy change into?
   A. heat
   B. water
   C. electricity
   D. hot plate

Questions 1 & 2 adapted from MCAS 2008 Science and Technology/Engineering Assessment - Grade 5.

EiE: Designing Alarm Circuits
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Energy can be changed from one form to another.

*Directions: For each of the objects listed below, write what form the energy starts as and what form the energy changes to.*

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<tr>
<th>Object</th>
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<th>Changes to...</th>
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<tbody>
<tr>
<td>light bulb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>piano</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>toaster</td>
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<td>electrical, mechanical, heat</td>
<td>sound, light, mechanical</td>
</tr>
<tr>
<td>piano</td>
<td>sound, mechanical, electrical</td>
<td>light, sound, electrical</td>
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<tr>
<td>toaster</td>
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1. In the box below, draw a schematic diagram that correctly represents this circuit.

![Diagram of a circuit with a battery, switch, and light bulb]

2. Which of the following circuits does NOT match this schematic diagram? Circle the BEST answer.

![Four options of circuits with light bulbs and switches]
Directions: For each question below, circle the BEST answer.

1. Which of the following schematic diagrams correctly represents this circuit?

2. Which of the following circuits does NOT match this schematic diagram?
Directions: For the question below, circle the BEST answer.

1. This diagram shows a glowing light bulb connected to a battery using wires. Electric current is flowing from the battery, through Wire #1 to the bulb.

What do you think is happening in Wire #2?

A. The electric current flows through Wire #2 from the battery to the bulb.

B. The electric current flows through Wire #2 away from the bulb to the battery.

C. No electric current flows through Wire #2, it is all used up by the bulb.
The diagram below shows 2 batteries connected to 3 light bulbs and 3 different objects labeled A, B, and C.

1. Circle ALL of the objects that are acting as conductors.

2. Put an X over ALL of the objects that are acting as insulators.
1. You need to design a circuit that can turn on a light bulb, an alarm, and a motor using a switch. You have 1 very strong battery and some wire. You can use the back of this page to sketch your ideas. Draw your plan for the circuit in the box below.

2. You have a green light and a red light. Design a circuit in which the green light is always on and the red light is controlled by a switch. You can use the back of this page to sketch your ideas. Draw your plan for the circuit in the box below.
Directions: Design a circuit that can turn on a light bulb and an alarm using a switch. You also have 1 very strong battery and some wire. You can sketch your ideas on the back of this page.

1. Draw your plan for the circuit in the box below. Label the parts.
What is an Electrical Engineer?

Draw and label a picture of an electrical engineer at work.

A good picture would show someone working to solve a problem involving electricity. They may be shown using or drawing a schematic diagram or designing/improving things that involve electricity.

Examples include: someone designing or improving a power plant, telecommunication systems or devices, computers, video game systems, hand-held devices, DVD players, etc.

Explain your drawing of an electrical engineer at work below.

Answers will vary, but may include: Someone who uses what they know about math and science to solve problems involving electricity.
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   Circle the **BEST** answer.
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   - B. light
   - C. darkness
   - D. electricity

2. What form(s) does the energy change into?
   Check **ALL** that apply.
   - ✓ light
   - □ lamp
   - □ light bulb
   - □ electricity
   - ✓ heat
Directions: For each question below, circle the BEST answer.

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<td>electrical</td>
<td>light (and/or heat)</td>
</tr>
<tr>
<td>piano</td>
<td>mechanical</td>
<td>sound</td>
</tr>
<tr>
<td>fan</td>
<td>electrical</td>
<td>mechanical (and/or sound)</td>
</tr>
<tr>
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![Circuit Diagram](image1)

2. You have a green light and a red light. Design a circuit in which the green light is always on and the red light is controlled by a switch. You can use the back of this page to sketch your ideas. Draw your circuit in the box below.

![Circuit Diagram](image2)
Directions: Design a circuit that can turn on a light bulb and an alarm using a switch. You have 1 very strong battery and some wire. You can sketch your ideas on the back of this page.

1. Draw your circuit in the box below. Label the parts.