

Guided Background Research Worksheet **Answer Key**

1. Define the following words or phrases and use them each in a sentence that shows understanding.

bioengineering	<p>Definition: The application of engineering skills to solve problems in the fields of life science.</p>	<p>Looks like: Any picture, sketch, diagram or symbol that helps the student remember the meaning of the vocabulary word.</p>
	<p>Sentence: Designing an artificial hand is an example of <u>bioengineering</u>.</p>	
biomedical engineering	<p>Definition: The application of engineering skills to solve problems in the medical field.</p>	<p>Looks like: Any picture, sketch, diagram or symbol that helps the student remember the meaning of the vocabulary word.</p>
	<p>Sentence: <u>Biomedical engineering</u> has helped improve the lives of many injured soldiers returning home from war.</p>	
crumple zone	<p>Definition: The part of a motor vehicle designed to crumple easily and absorb the impact during a collision.</p>	<p>Looks like: Any picture, sketch, diagram or symbol that helps the student remember the meaning of the vocabulary word.</p>
	<p>Sentence: When my mom crashed her car, the <u>crumple zone</u> helped to protect her from injury.</p>	
safety restraint	<p>Definition: A protective strap or harness designed to prevent injury.</p>	<p>Looks like: Any picture, sketch, diagram or symbol that helps the student remember the meaning of the vocabulary word.</p>
	<p>Sentence: The <u>safety restraint</u> left a bruise on my shoulder when I crashed my car.</p>	
airbag	<p>Definition: A safety device designed to inflate automatically in a collision and prevents the passengers from being thrown forwards.</p>	<p>Looks like: Any picture, sketch, diagram or symbol that helps the student remember the meaning of the vocabulary word.</p>
	<p>Sentence: The <u>airbag</u> seemed to instantly deploy when the vehicle crashed into the building.</p>	

2. Answer the following questions.

Why are ambulances important to patient care?

Ambulances enable patients to receive immediate emergency medical treatment during transport, before reaching a hospital. If patients were being transported in traditional vehicles, they would not be able to receive many medical treatments that are available in a fully equipped ambulance.

Are ambulances allowed to speed? Why or why not?

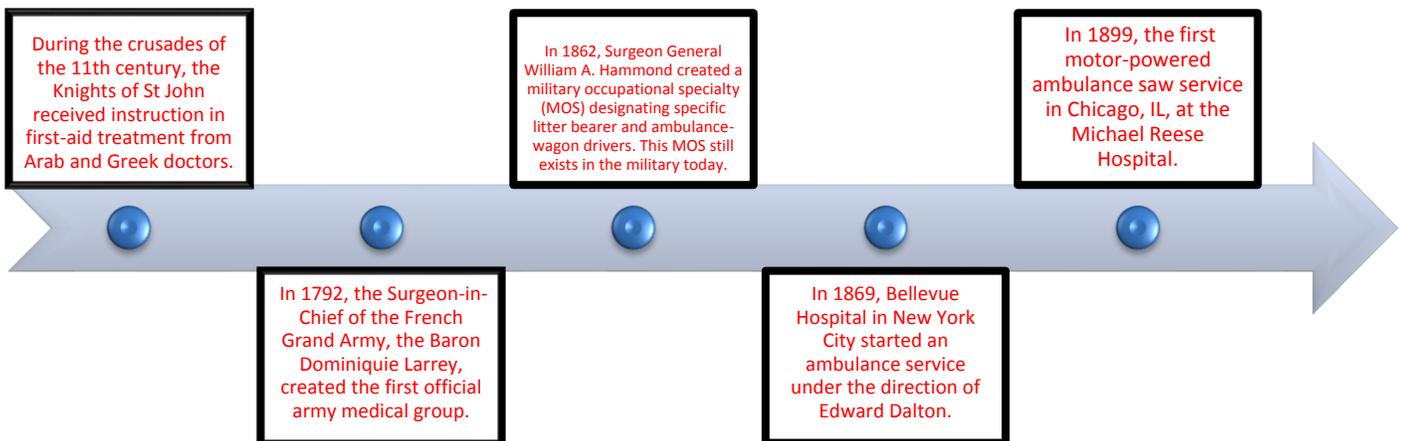
According to Massachusetts Statutes Chapter 89: Section 7B. Operation of emergency vehicles ambulance drivers are allowed to speed as long as they exercise caution. *Source:*

http://www.iafc.org/files/downloads/VEHICLE_SAFETY/STATEemergVEHcodes/Massachusetts.pdf

Describe the current method of keeping patients safe during ambulance transport.

During ambulance transport patients are kept safe by being attached to a gurney with a five-point safety harness. The gurney is securely attached to the ambulance floor.

3. On this timeline, indicate and describe five major advancements in the history of the ambulance. Make sure to provide the dates and the person(s) responsible for the advancements.



4. Identify and explain Sir Isaac Newton’s three law of motion.

	Identify the law	Explain what the law means
1st Law	An object at rest will remain at rest unless acted on by an unbalanced force. An object in motion continues in motion with the same speed and in the same direction unless acted upon by an unbalanced force.	This means that there is a natural tendency of objects to keep on doing what they're doing. All objects resist changes in their state of motion. In the absence of an unbalanced force, an object in motion will maintain this state of motion.
2nd Law	Acceleration is produced when a force acts on a mass. The greater the mass (of the object being accelerated) the greater the amount of force needed (to accelerate the object).	Using common sense and personal experience, we can understand this law because everyone knows that heavier objects require more force to move the same distance as lighter objects.
3rd Law	For every action there is an equal and opposite re-action.	This means that for every force there is a reaction force that is equal in size, but opposite in direction. So whenever an object pushes another object it gets pushed back in the opposite direction equally hard.

****Bonus Question: Who or what were Fig Newtons named after?** The town of Newton, Massachusetts