FLINN SCIENTIFIC

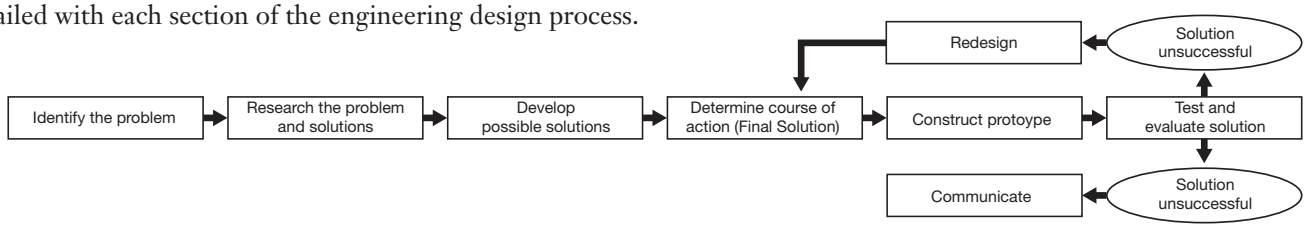
Name_____

Broken Bones Worksheet

Data and Observations

Engineering Design Process

Directions: Referencing the graphic organizer below, answer the questions as directed within the procedure. Be very detailed with each section of the engineering design process.



1. What is the problem being addressed in this activity?

2. Record the research that was discovered as potential solutions to the problem.

3. Develop a step-by-step procedure of how the surgery will be performed. Include a description and sketch of the possible
device(s) that will be used to correct the problem and how it will work.

Independent Design Evaluation

Name:		**Name:**	
Strengths	Weaknesses	Strengths	Weaknesses
Name:		**Name:**	
Strengths	Weaknesses	Strengths	Weaknesses

4. After discussing and refining the individual designs, collaborate with your group to design the final implant device and develop detailed procedural steps for performing the surgery.

5. Construct a prototype—a preliminary model—of the implantation device that will repair the femoral shaft fracture. Record the strengths and weaknesses of the prototype and any changes that were made for the final design.

6. Perform the surgery, which includes incision, implantation of the device, and suturing the tissue, to repair the broken bone. Record each step with great detail. Upon completion of the surgery, evaluate the effectiveness by examining the femur by checking for strength and stability, feeling the skin for abnormalities, and the cleanliness of the sutures (scar).

	Excellent Rating	Good Rating	Fair Rating	Poor Rating
Student Evaluation on Design of Procedure				
Teacher Evaluation on Design of Procedure				
Student Evaluation on Execution of Surgery				
Teacher Evaluation on Execution of Surgery				

7. In paragraph form, write a post-operation summary about the surgical procedure to the patient and their family explaining what was performed and the success of the surgery.

8. Discuss what changes you would make to your biomedical device and surgical procedures for the future.