



**Lesson 2: Testing the Best Shape**

In addition to the material that a shield is made of, the shape of a shield is very important. Even if a bomb disposal expert has a shield made of a strong material, if the shield is in a shape that is not very effective, the bomb disposal expert could suffer serious injuries if a bomb detonates. Which shield shape is most effective? Test it and find out for yourself!

**Doing the Science**

1. Start the Explosion Shield Simulation by clicking on the “Sim” tab.
2. Click on the “Design” button.
3. In the “Material Type” section, click on the right arrow once so that “Carbon Fiber” appears.
4. In the “Shape” section, click on the right arrow once so that the rectangular shape appears.
5. Click on the “Test” button.
6. In the testing room, there is a dummy standing behind the shield you designed. Click on the red trigger that the dummy is holding to set off the bomb.
7. Click on the “Analysis” button.
8. Hover over each yellow and black icon to read the “Damage Stats”. Record the damages into Table 1 below.
9. Repeat steps 2-8 with the different shield shapes given in Table 1.

**Table 1.**

| <b>Material Type</b>                           | <b>Head</b> | <b>Stomach</b> | <b>Right Arm</b> | <b>Left Arm</b> | <b>Right Leg</b> | <b>Left Leg</b> |
|--|-------------|----------------|------------------|-----------------|------------------|-----------------|
| <b>Rectangular and Flat</b>                    |             |                |                  |                 |                  |                 |
| <b>Rectangular with Slight Bevel Outward</b>   |             |                |                  |                 |                  |                 |
| <b>Rectangular with Moderate Bevel Outward</b> |             |                |                  |                 |                  |                 |
| <b>Round and Flat</b>                          |             |                |                  |                 |                  |                 |
| <b>Rounded With Slight Bevel Outward</b>       |             |                |                  |                 |                  |                 |
| <b>Rounded With Moderate Bevel Outward</b>     |             |                |                  |                 |                  |                 |

**Do You Understand?**

1. Which shape is the best to use to construct a shield? Which is the poorest? Why?