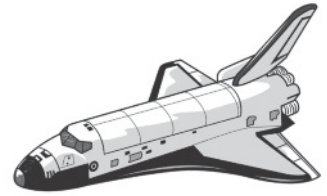


# Materials Testing

**Did You Know?** Material engineers research, develop, and test different materials to be used in products. They are involved in making all kinds of products, such as keyboards, phones, and rockets. After testing different materials, engineers may decide that ceramic, plastic, or metal is the best choice for a product.



- 1 One engineer tests new cell phone covers. She has 5 different types of plastics to test. For each type of plastic, she needs to make 6 covers. Will the total number of covers be even or odd? Explain.

**Even; Sample answer: There are 5 groups of 6 covers, which is  $5 \times 6$ . When one factor is even, the product is even.**

- 2 A company tests 5 different paints. They use each paint to color 7 toys. Will the total number of toys painted be even or odd? Explain.

**Odd; Sample answer: There are 5 groups of 7 toys, which is  $7 \times 5$ . When both factors are odd, the product is odd.**

- 3 A balloon factory tests 4 different materials for a new balloon. They will do the same number of tests on each material. The manager says that they need to do an odd number of total tests. How can they do this?

**It is not possible; Sample answer: 4 is an even number, so any multiple of 4 also will be even.**

- 4 **Extension** Some engineers have 9 different metals to test. For each metal, they will do the same number of tests. They want to have an even number of tests between 40 and 80. What are the possible number of total tests they could do? How many tests could they do with each metal? Explain.

**54 or 72 total tests; 6 or 8 tests with each metal; Sample answer: They need to do between 5 and 8 tests for each metal to have a total between 40 and 80. However, for the total to be an even number, they need to do 6 or 8 tests on each metal.**