

6b Build an engineering project: a Blast Car

Engineers of all kinds are needed in the natural gas and oil industry! Engineers are often team leaders who work with other engineers, scientists and technicians solving problems like choosing the best site for drilling, maintaining equipment on a rig, ensuring the safety of workers and many other jobs. They use the engineering design process to develop new equipment like drill bits and new extraction processes like horizontal drilling.

Challenge: Experience the engineering design process through sketching an idea for a racer, laying out a design, constructing the car, conducting trial tests, modifying a design, and adding finishing details. Design a racer for optimum performance!

Materials

- Blast Car kit (pictured)
- Engineering Merit Badge Workbook
- Variety of hand tools: screwdriver, pliers, wood carving tools, sandpaper

Directions

1. Your leader will describe the challenge including the race course and the scoring options.
2. Use this space to sketch a possible design for your race car. Be sure to consider the engineering principles in the sidebar.
3. Discuss your design with your leader and/or use the foam to make a model before you use the woodworking tools. You only get *one* car!
4. Test your car. Did you need to make any adjustments? List them here:

5. Race your car! What was the outcome?

6. Which car won and why?

Engineering principles

Thrust: Force that propels an object and keeps it moving (CO₂ canister, gas under pressure).

Drag: Force that resists object's movement through air (smooth, round surfaces move faster).

Friction: Force that resists relative motion between two objects in contact (gravel slows car).

Velocity: Time rate or change of position of an object in one direction; velocity = distance/ time (car with lower weight/mass will accelerate faster).

