Chapter 7

ENRICHMENT

Use with Section 2

• Newton's Second Law

Off to the Races

It's Friday afternoon and all you can think about during science is the upcoming go-cart races. You and a friend have been working on your entry for over two months. With race weekend only a month away, there is still a lot of work to be done.

Your friend comes over after school with a worried look on her face. She explains to you that Eunice and Bert have designed an awesome cart that no one could possibly beat. As the two of you sit and mope, an idea springs into your head.

"Wasn't the science teacher talking about something that had to do with acceleration? Yeah, it was something about Newton."

Finally, you remember exactly what it was. "Newton's second law of motion states that the acceleration of an object is directly proportional to the force acting on it, and inversely proportional to its mass."

You look to your friend with a smile on your face and tell her it is time to get to work. You explain that by using Newton's second law of motion you can help make sure that your go-cart is the fastest one at the races.

Newton's second law of motion can be written as Acceleration = Net Force/Mass or $A = F_{net}/M$.

1. If your go-cart weighs 500 kg, what is the force you will have to apply to accelerate it at +1.5 m/s^2?

2. You discover that Eunice and Bert's go-cart weighs 400 kg and will have a 675 N force acting on it. How fast will it accelerate (to the nearest tenth)?

3. If you are able to decrease the mass of your go-cart by 15%, and the same force that was applied in number 1 is applied, will your go-cart be able to beat Eunice and Bert's? (Round your answer to the nearest tenth.) Explain.