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21. What's My Risk?

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Overview

In this activity, students measure their body mass index (BMI) to determine their level of risk for certain diseases.

Objectives

Students will be able to:

- apply and use BMI formulas.
- construct accurate graphs.
- analyze and interpret data.

Materials

- Graph paper
- Graphing calculators

Teaching Notes

1. Students should work in pairs or small groups for this activity.
2. Prior to the activity, students will need to determine their weight and height.
3. Many students are unsure of how to begin to construct a graph. Review graphing fundamentals with those students.
4. Likewise, when they are using graphing calculators, many students have difficulty choosing appropriate settings for their graphs. Review this procedure prior to using the activity.
5. Students should have some familiarity with working with lines of best fit and with doing linear regressions.
6. Students shouldn't be alarmed if their BMI indicates that they are in a high-risk category. Simply advise them to consult a doctor or other medical professional.

Selected Answers

1–6. Answers will vary depending on students' heights and weights.

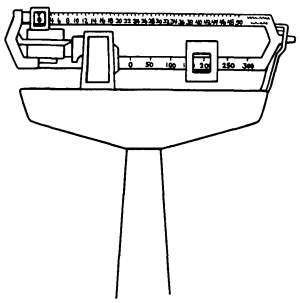
7. Students should point out that height is essentially a constant, not actually a squared term.

Extension Activities

Students can research other instances in which mathematical formulas are used for fitness measurements.

Name_____ Date _____

21. What's My Risk?



Body mass index (BMI) is a measure of the ratio between your weight and your height squared. If your BMI is high, you may have an increased risk of developing certain diseases, such as adult-onset diabetes, cardiovascular disease, and hypertension. To find out your level of risk, and how changing your weight affects your risk level, follow the steps below.

1. To find your BMI, first measure your height and weight. With your partner or in your group, measure each other's height in inches and record the result below. Likewise, weigh yourself in pounds and record the result below.

   Height (inches): _____ Weight (pounds): _____

2. The formula used to calculate BMI requires metric units. Convert your height and weight to metric units using the conversion factors listed.

   inches × 0.0254 = meters pounds × 0.4536 = kilograms

   Height (meters): _____ Weight (kilograms): _____

3. Calculate your BMI using the formula below:

$$\text{BMI} = \frac{\text{weight(kg)}}{\text{height}^2(\text{m}^2)} \qquad \text{BMI} = \_\_\_\_\_$$

BMI	Health risk
<25	Minimal
25-27	Low
27-30	Moderate
30-35	High
35-40	Very high
40+	Extremely high

4. Construct a graph that shows the relationship between BMI and weight for someone your height.
5. Write an equation that represents the data in your graph.

   BMI equation: _____

6. Explain the relationship between BMI and weight. Then explain the relationship between BMI and height.
7. Explain why the data don't fit a quadratic curve even though one of the terms in your equation is squared.