

# Unit 2 Lesson 18: Representing Situations with Inequalities

## 1 What Do Those Symbols Mean? (Warm up)

### Student Task Statement

1. Match each inequality to the meaning of a symbol within it.
  - a.  $h > 50$ 
    - less than or equal to
  - b.  $h \leq 20$ 
    - greater than
  - c.  $30 \geq h$ 
    - greater than or equal to
2. Is 25 a solution to any of the inequalities? Which one(s)?
3. Is 40 a solution to any of the inequalities? Which one(s)?
4. Is 30 a solution to any of the inequalities? Which one(s)?

## 2 Planning the Senior Ball

### Student Task Statement

Seniors in a student council of a high school are trying to come up with a budget for the Senior Ball. Here is some information they have gathered:

- Last year, 120 people attended. It was a success and is expected to be even bigger this year. Anywhere up to 200 people might attend.
- There needs to be at least 1 chaperone for every 20 students.
- The ticket price can not exceed \$20 per person.
- The revenue from ticket sales needs to cover the cost of the meals and entertainment, and also make a profit of at least \$200 to be contributed to the school.

Here are some inequalities the seniors wrote about the situation. Each letter stands for one quantity in the situation. Determine what is meant by each letter.

- $t \leq 20$
- $120 \leq p \leq 200$
- $pt - m \geq 200$
- $c \geq \frac{p}{20}$

### 3 Elevator Constraints

#### Student Task Statement

An elevator car in a skyscraper can hold at most 15 people. For safety reasons, each car can carry a maximum of 1,500 kg. On average, an adult weighs 70 kg and a child weighs 35 kg. Assume that each person carries 4 kg of gear with them.

1. Write as many equations and inequalities as you can think of to represent the constraints in this situation. Be sure to specify the meaning of any letters that you use. (Avoid using the letters  $z$ ,  $m$ , or  $g$ .)
2. Trade your work with a partner and read each other's equations and inequalities.
  - a. Explain to your partner what you think their statements mean, and listen to their explanation of yours.
  - b. Make adjustments to your equations and inequalities so that they are communicated more clearly.
3. Rewrite your equations and inequalities so that they would work for a different building where:
  - an elevator car can hold at most  $z$  people
  - each car can carry a maximum of  $m$  kilograms
  - each person carries  $g$  kg of gear