

# Graphing a Flag Hoist

## Case Overview

### Background on the Classroom Lesson

This video comes from an 8<sup>th</sup>-grade mathematics class early in the school year. The class recently began a four-week unit on functions, and students have not yet been formally introduced to the notion of slope.

### Student Activity

The activity is part of the Shell Centre materials, available at <https://www.stem.org.uk/rxswr>.

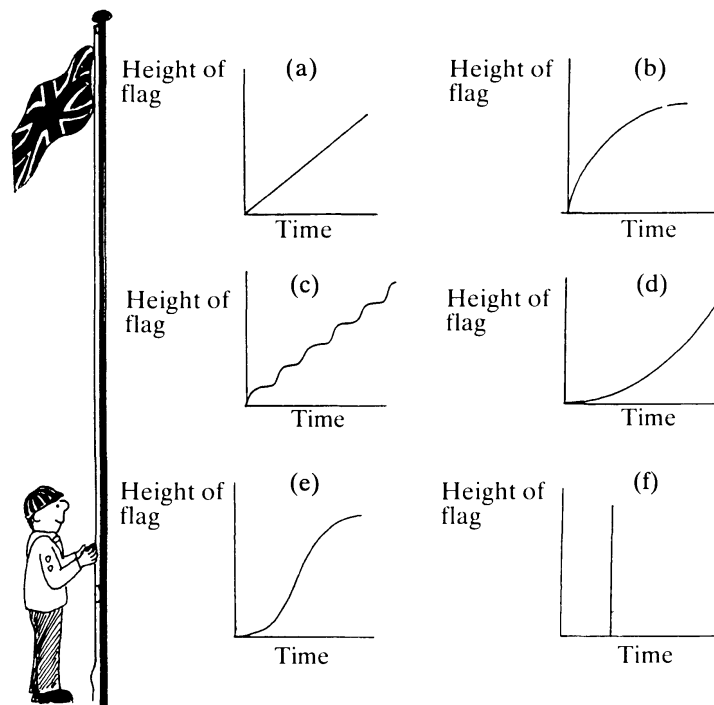
Citation: Swan, M. (Ed.) (1985). *The language of functions and graphs: An examination module for secondary schools*. Manchester, UK: Joint Matriculation Board, Shell Centre for Mathematical Education.

### SKETCHING GRAPHS FROM WORDS

#### Hoisting the flag

Every morning, on the summer camp, the youngest boy scout has to hoist a flag to the top of the flagpole.

- Explain in words what each of the graphs below would mean.
- Which graph shows this situation most realistically? Explain.
- Which graph is the least realistic? Explain.



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### *Overview of the Video*

In the video, the class discusses which of six graphs most — and least — realistically represents a flag being hoisted. They first discuss Graph (f), then Graph (c), briefly Graph (a), and finally Graph (b). When watching (or re-watching), focus on the different explanations student raise for each of the graphs, particularly Graph (f). Consider which components of the graphs students seem to pay most attention to.

### *Questions to Consider about Student Thinking*

We think some of the richest student thinking in this video occurs around Graphs (f), (c), and (a). In what follows, we provide sets of questions about each graph to scaffold analysis of students' ideas.

- 1) Thinking about Graph (f):
  - a. What are students' reasons for claiming that Graph (f) is not realistic?
  - b. What is Sean's idea about Graph (f)?
  - c. How does Sean understand the relationship between elements of the graph and elements of the situation?
  
- 2) Thinking about Graph (c):
  - a. How do students describe the motion associated with Graph (c)?
  - b. Why do students claim that Graph (c) is realistic?
  - c. How are students reasoning about the relationship between the slope of the graph and the speed of the boy scout's pulling?
  
- 3) Thinking about Graph (a):
  - a. What is Jennifer's idea about Graph (c)? About Graph (a)?
  - b. Why does Garret think that Graph (a) is the most realistic?