Getting Ready to Read: Finding Signal Words

MATHEMATICS

Writers use signal words and phrases (also called *transition words* or *connectors*) to link ideas and help the reader follow the flow of the information.

Purpose

- Preview the text structure.
- Identify signal words and phrases and their purposes.
- Familiarize students with the organizational pattern of a text.

Payoff

Students will:

- make connections between reading and writing tasks in related subject-specific texts.
- read and reread subject-specific reading material.
- practise their reading strategies of skimming, scanning, and rereading; make predictions about the topic and content as they read and reread; learn signal words; and use the signal words when summarizing.

Tips and Resources

- *Signal words* are words or phrases that cue the reader about an organizational pattern in the text or show a link or transition between ideas. S*ignal words* can also cue mathematical thinking, action, and communication processes.
- Mathematics activities, questions and problems often have an organizational pattern that starts with setting the context, followed by mathematics information about the context, and finally a question or several questions based on the context and information. Students can use signal words to identify the question(s) and the required format of the response(s). When students know the question(s), they can reread the problem with deeper understanding. In other types of reading, the initial paragraph clearly identifies the purpose of the text. However in mathematics reading, the purpose (e.g., responding to a specific question) is often not identified until near the end of the text.
- Mathematics prompts are signal words that students need to identify and understand in order to provide the required type of response. For example, the *signal words* “create” “compare” and “describe” require different types of responses.
- In mathematics learning and assessment tasks, *signal words* can highlight the types of mathematics knowledge and skills (i.e., Knowledge and Understanding, Application, Thinking/Inquiry/Problem Solving, Communication) inherent in the prompts.
- In Ontario’s large scale assessments, *signal words* are used consistently so that students can better understand the mathematics that they should include in their responses. For a sample list which includes EQAO’s key words, see the Student/Teacher Resource, *Signal Words – Mathematics Prompts.*
- A graphic organizer can provide a visual guide to the organizational structure of a text (see Student/Teacher Resource*, Signal Words – Flow Chart for Sample Organizational Structure*).
  See Student/Teacher Resource, Finding Signal Words – Samples.

Further Support

- Before students read an unfamiliar or challenging selection, provide them with the signal words and the related organizational pattern (e.g., mathematics context, mathematics information, prompt, response).
- Encourage students to scan reading passages to identify signal words and preview the text structure before they read.
- Have students reread the text after identifying signal words. (Students may read independently, with a partner, or listen as another person reads aloud.)

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What teachers do	What students do
Before	
• Show a text passage that has signal words highlighted e.g., from a textbook lesson, from a released EQAO assessment task, or from an Ontario Curriculum Mathematics Exemplars task.	• Scan the familiar passage to identify highlighted words and phrases.
• Brainstorm a list of additional signal words.	• Contribute to brainstorming.
• In small groups, have students rephrase the signal words (see Student/Teacher Resource, *Signal Words – Mathematics Prompts*).	• Rephrase signal words.
• Tell students that authors use particular organizational structures to sequence and link ideas together so that readers understand the flow of ideas and the requirements of a mathematics task.	
• Have students determine the location of the mathematics prompts in the organizational structure.	• Analyse the text to determine the location of the mathematics prompts.
• Use a graphic organizer (e.g., flow chart) to help students understand the organizational structure of the text.	
During	
• Ask partners to scan a selected text and identify the signal words.	• Identify and record signal words. • Compare their words with the findings from other partners.
• Ask students to identify how some of the signal words relate to the meaning of the passage e.g., "These signal words indicate a sequence. This will help me track the ideas and information in order. A sequence pattern sometimes means I will be reading a procedure or a set of instructions."	• Use the signal words as clues to recognize the organizational pattern of the text.
• Ask students to use the signal words to help them read to understand the ideas, information, and mathematical instructions in the passage.	• Read the passage and identify the mathematics context, important mathematical information, mathematical prompts. • Orally share analysis of the mathematics text with a partner.
After	
• Model how to glean the key mathematical ideas from the context, information, and prompts using the signal words and phrases.	• Identify the key parts of the mathematics text.
• Create a class chart of the signal words and how they might be used to help the reader understand the text. See Student/Teacher Resource, *Signal Words – Mathematics Prompts.* Ask students to describe how using the signal words helped them to understand and identify the mathematics context, information, and prompts. Students might record their responses in a learning log or share orally with a partner.	• Contribute to the class chart. • Describe how they used the signal words to help understand what they read and then decide what mathematical information to use and actions to take.

Notes

Signal Words – Mathematics Prompts

Mathematics signal words or mathematics instructional words can be used as a strategy to:

- identify the type of mathematical response required: comparison, computations, description, explanation, justification, list, calculation steps.
- ensure that the mathematical response is directly answering the question or problem posed and includes all necessary mathematical details.

These mathematics signal words are commonly used as mathematical prompts:

Calculate:	Compute the number that answers the question.
Classify:	Organize objects into groups, sets, or categories according to a rule.
Compare:	Tell what is the same and what is different.
Construct:	Build or make a model.
Create:	Make your own example.
Describe:	Draw, model, say, or write about what something is to create a mental picture for the reader.
Draw:	Represent something in a pictorial form.
Estimate:	Make a reasonable guess about a quantity of an object based on your knowledge of the physical characteristics of the object and its environment.
Explain:	Use words and symbols to make your solutions clear and understandable.
Justify:	Give reasons and evidence to show your answer is correct or proper.
List:	Write down or identify in point form.
Measure:	Use an object or tool to describe the physical characteristics of an object.
Model:	Show an idea or process using objects and/or pictures.
Predict:	Work out and say what you think will happen based on what you know.
Relate:	Show and explain a connection between ideas, objects, drawings, numbers, and events.

Represent:	Communicate ideas and information in different ways to show understanding (e.g., make a model, draw a picture, show a calculation).
Simplify:	Reduce the complexity while maintaining equivalency.
Solve:	Make a plan and carry out the plan to develop a solution to a problem.
Sort:	Separate objects, drawings, ideas, or numbers according to an attribute or characteristic.
Show your work:	Record all calculations. Include all the steps you went through to get your answer. You may want to use words, numbers, graphs, diagrams, symbols, and/or charts.

Signal Words – Flow Chart for Sample Organizational Structure

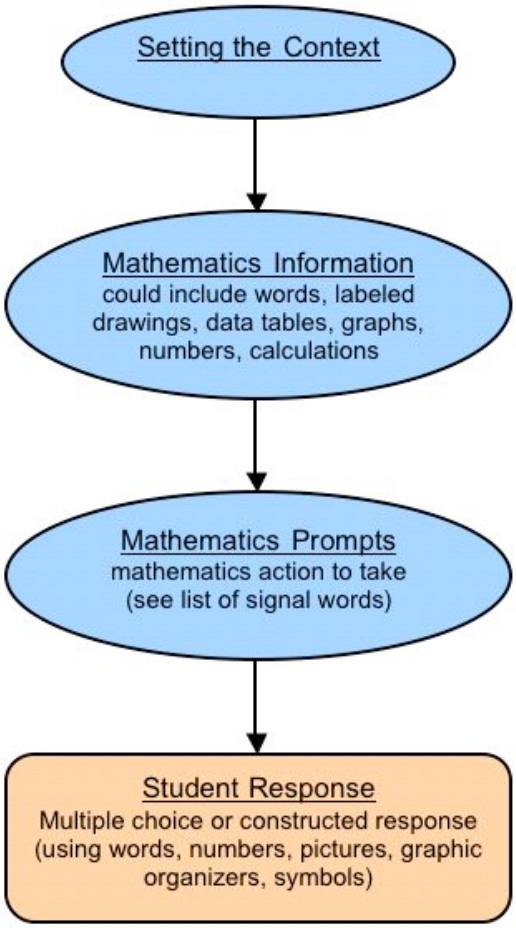
Mathematics activities, questions, and problems often follow a sequence: setting a context, giving mathematics information, prompting a response. When students see this organizational pattern, they can better identify the information they are searching for as they read the text.

Setting the Context is describing the situation for the task.

Mathematics Information could include words, labeled drawings, data table and graph, numbers and calculations.

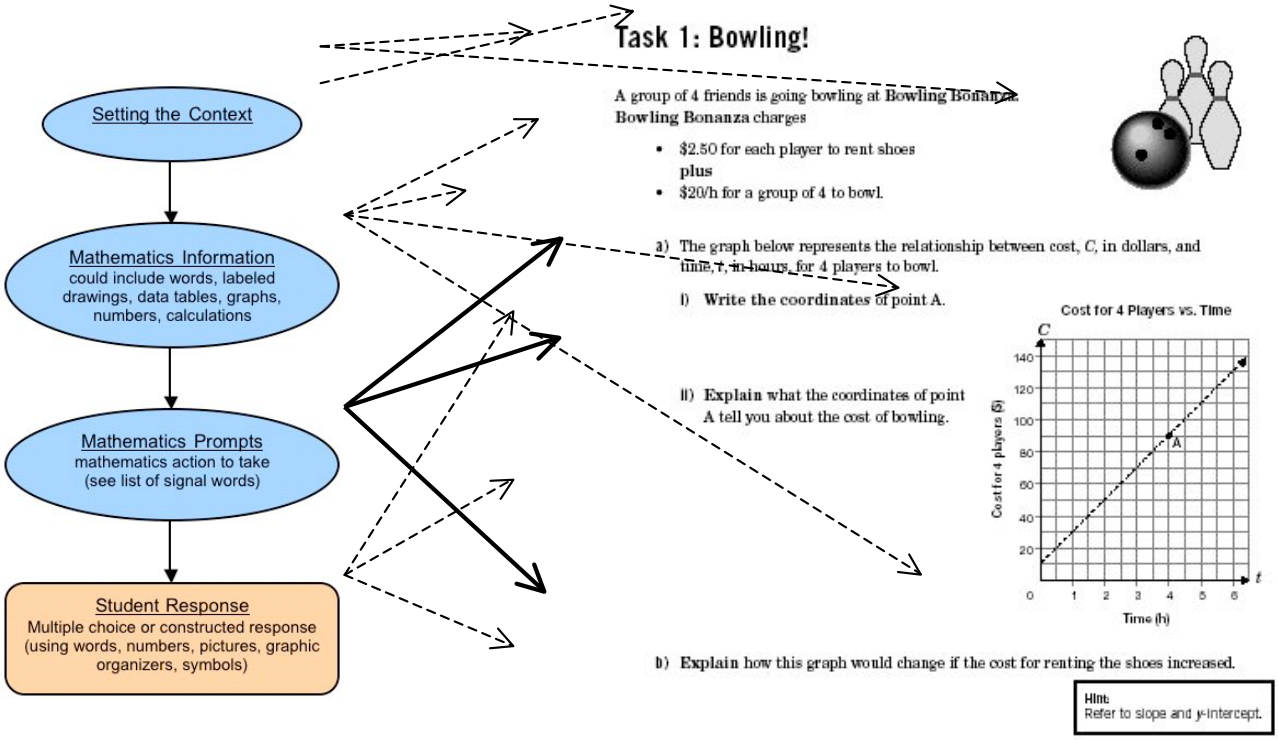
Mathematics Prompt identifies the action that the student should take. Mathematics *signal words*, like explain, describe, compare are used. Materials to use are often included in the prompt.

Student responses could include the selection of a response in a multiple choice task or explanations and justifications for constructed response tasks (short, extended), using words, numbers, pictures, graphic organizers, and symbols.



Finding Signal Words – Samples (Grade 9)

1. This example shows the organization of one EQAO Task. What are the signal words?



2. Scan the text to identify *signal words* and *unfamiliar words* in this EQAO Short Answer Question. Read the question and use the flow chart to help you understand the organizational structure of the question. Identify the mathematics information and the context.

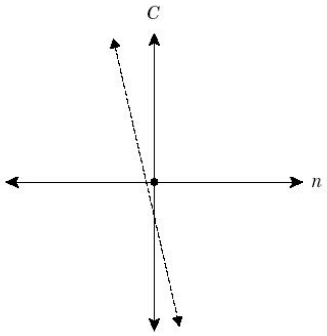
2. Veza uses the equation $C = 43n + 50$ to model the cost of soccer shirts for the team, where

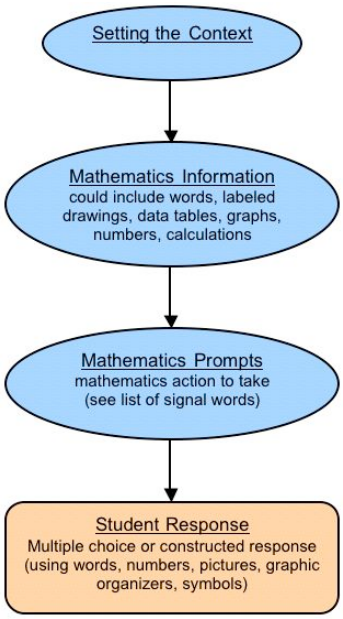
C represents the total cost in dollars,
and
n represents the number of soccer shirts.

Veza sketches the graph of this relationship.

Explain why the graph shown **cannot** represent the total cost of soccer shirts.

List at least two reasons.





EQAO Questions are from the 2002-2003 Release Material (www.eqao.com)