

What's in the box?

Critical Challenge

Critical task Based on all the clues, guess one of the things in the mystery box.

Overview This challenge introduces the study of families and the use of objects to learn about families. A mystery box containing selected teacher mementos provides the catalyst for developing curiosity and teaching students the concepts of “clue”, “guess” and “best guess”. Students acquire the habits of a detective by checking their guesses against clues on the mystery contents of a mug. They then generate clues and guesses about the content of the teacher’s mystery box before offering their best guess.

Objectives

Broad understanding We can often tell a lot about something by looking for clues for the most reasonable guess.

Requisite tools

Background knowledge

- knowledge of the qualities of familiar objects



Criteria for judgment

- criteria for a reasonable guess (e.g., fits one or more clues)
- criteria for a best guess (e.g., fits all the clues)



Critical thinking vocabulary

- clues
- guess



Thinking strategies

- check each guess



Habits of mind

- curiosity
- attention to detail



Suggested Activities

Pre-planning

Create a mystery box

- Prior to starting the unit, develop your own family memory box. Locate a box with a lid (e.g., shoe box, hatbox, file box) and carefully select five to eight family mementos. Include a photograph showing only your immediate family and another showing you with other relatives. Include photographs and artifacts representing special family memories, some of which are straightforward (e.g., first book read, favourite toy, first ballet shoes) and others which are less obvious to decipher (e.g., a feather representing a bird that the family helped back to health, a British penny given to you by your English grandfather). Wrap the lid and body of the box with paper that has a design representing your family (e.g., picture from a calendar of Italy, if you are of Italian ancestry; tartan design for Scottish background). Tie a cord around the box to secure it. The contents of the your mystery box will be used as a teaching tool throughout the unit.

Create a mystery mug

- A second artifact, introduced in the very first session, is a mug with a bit of liquid hot chocolate left in it. Prepare it in advance, preferably in a mug that looks to be a child's mug.

Session One

Blackline Masters #1-3

Stimulate curiosity

- Place the wrapped mystery box containing your family mementos at the front of the class. Ignore the box until students express interest in it. When they begin to ask questions, pursue the concept of curiosity by asking questions such as:
 - Why do you want to know?
 - How does not knowing make you feel?
 - What are some things you wonder about? (e.g., Is it light or heavy? valuable? dangerous?)



curiosity

Define curiosity

- Refer to the box as something students are curious about. As a class, agree on a definition of “curious”, possibly “something we do not know about and we wonder what it is”. Ask students to suggest things they are curious about. Record ideas on a “curiosity list” that might be posted on a bulletin board. You may want to refer, from time to time, to this list and try, as a class, to find answers to these questions.

Introduce being a detective

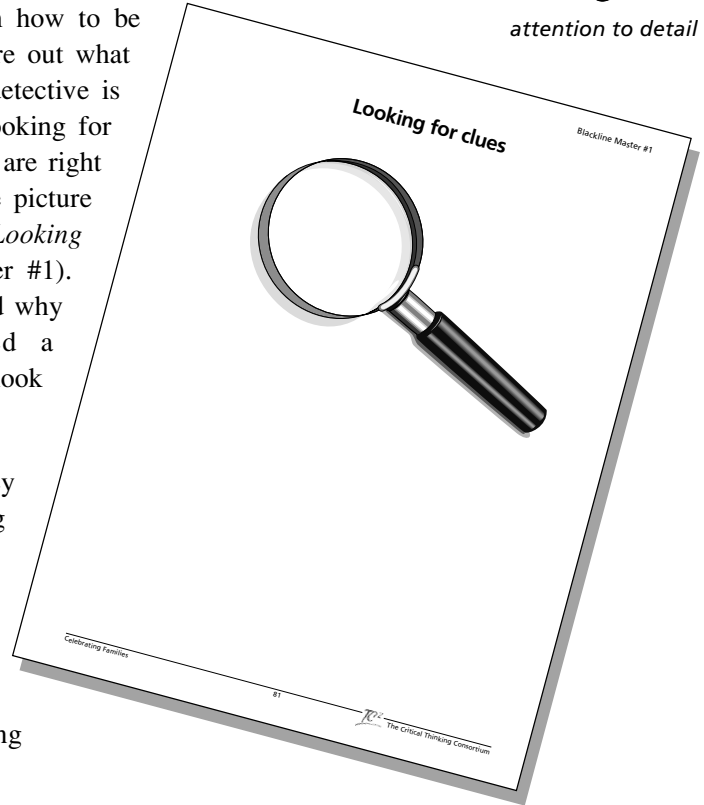
- Ask students “What could be in the box and how could we tell?” Explain that the class is going to learn how to be detectives in order to figure out what might be in the box. A detective is someone who is always looking for clues to see if her guesses are right or not. Show students the picture of a magnifying glass on *Looking for clues* (Blackline Master #1). Ask students what it is and why a detective might need a magnifying glass (needs to look very carefully).



attention to detail

Introduce the mystery drink

- Explain to the class that they are going to practice being detectives by helping you solve a mystery. Hold up the mug with the brown liquid in the bottom prepared prior to the lesson. Ask the following question:



What did the owner of this mug have for a drink this morning?

Explain that this cup is the only evidence the class has to solve this mystery.

Look for clues

- Invite students to put their (pretend) detective thinking caps on and look for clues. Ask students what “clues” or hints might help identify the contents of the mug. Encourage students to focus on the clues they can identify and hold off making a guess until they have looked for all the clues. If students do not respond immediately with clues, suggest that they use their senses (sight, smell, but not taste) to identify them. If necessary, guide students by asking what clue they can find from each of the following:
 - colour of the liquid;
 - smell of the liquid;
 - kind of container (i.e., a mug);
 - design (picture) on the mug (i.e., a child’s mug). If the mug is not obviously a child’s mug, explain that the mug belongs to a child their age (perhaps, your daughter or nephew).

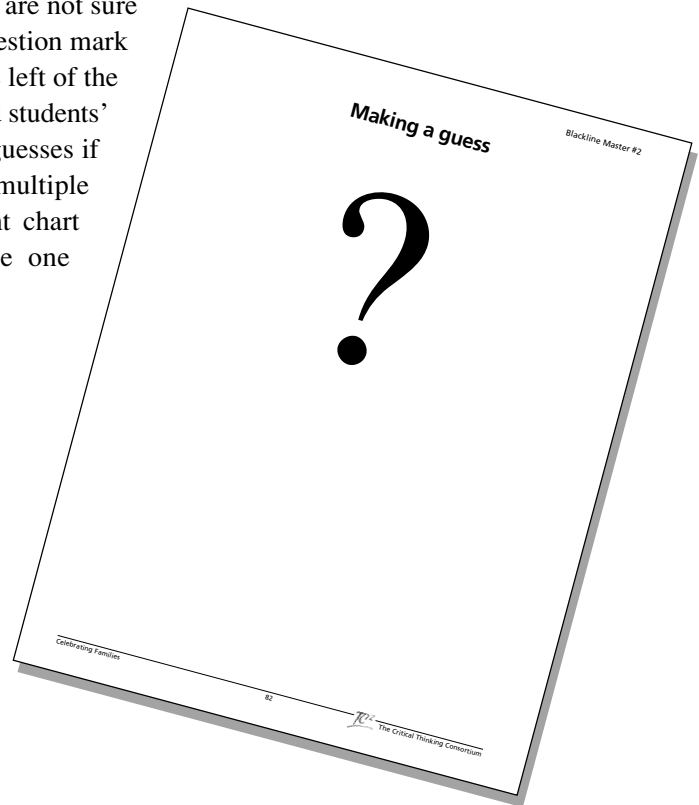


clue

Paste the picture of the magnifying glass from Blackline Master #1 on a board and along a horizontal line, print each of the relevant clues that the class has identified.

Generate guesses

- ▶ Based on these clues, ask students to guess what the drink might be. Show the picture of the question mark found on *Making a guess* (Blackline Master #2) and explain that a “guess” is an answer to a question or mystery, but we are not sure if it is correct. Paste the question mark (Blackline Master #2) to the left of the clues on the chart and record students’ guesses. Suggest possible guesses if students do not generate multiple possibilities. The emergent chart should look similar to the one below.



The mystery drink

Making a guess



Looking for clues



Could it be...?	colour: dark brown	container: in a mug	smell: strong smell	owner: child’s drink
<i>coffee</i>				
<i>tea</i>				
<i>hot chocolate</i>				
<i>chocolate milk</i>				
<i>Coca Cola</i>				

Look for reasonable guesses

- ▶ Now ask students how a detective would decide which guess seems to be the most reasonable guess. Ask students if water would be a good (reasonable) guess for the contents of the mug and why or why not. Determine that a reasonable (or good) guess is one that matches some (or perhaps many) of the clues. Suggest other “silly” guesses (e.g., gasoline or beer) to see if students can recognize when a guess is reasonable.



Check each guess

- Invite students to check that the guesses match each and every clue by placing a “✓” underneath a clue when a guess matches the clue and an “X” when it does not. Start with the first guess and check it against each clue using specific questions such as the following:

- Is coffee dark brown?
- Is coffee usually in a mug?
- Does coffee have a strong smell?
- Is coffee a child’s drink?

Follow the same procedure until “✓’s” and X’s” have been recorded on the chart for every guess.



knowledge of familiar objects



check each guess

Introduce idea of “best guess”

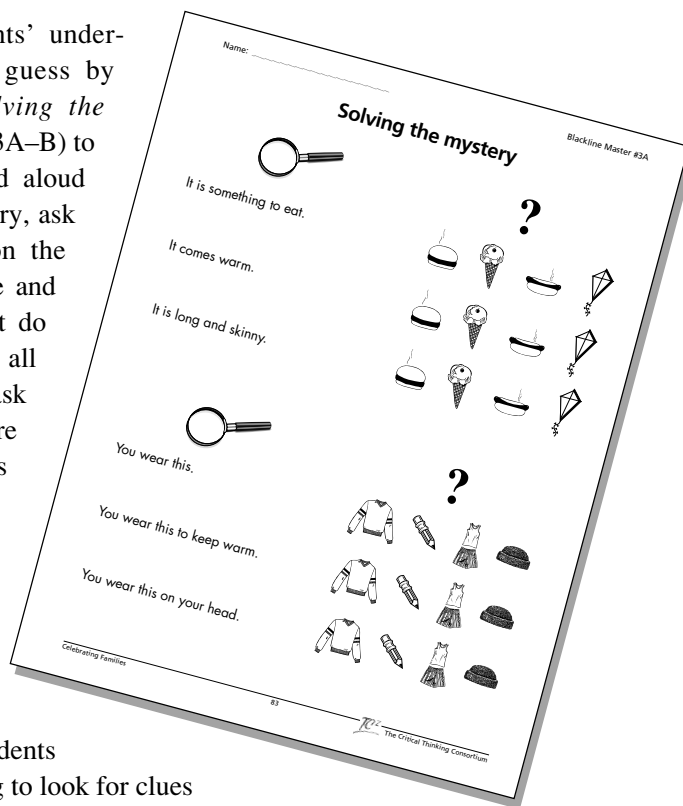
- Explain to students that they should look for guesses that fit all the clues. Only then do they have their “best guess”. Explain that the best answer is the guess which best fits all the clues (sometimes the match with a clue is a “maybe”). Invite students to decide which of the guesses best fits all the clues. If necessary guide students by checking each guess with the question; “Could it be...(coffee)?” and then examining the “✓’s” for each clue.



criteria for best guess

Check for understanding

- OPTIONAL: Check students’ understanding of a reasonable guess by distributing copies of *Solving the mystery* (Blackline Master #3A–B) to each student. As you read aloud each clue for the first mystery, ask students to place a “✓” on the pictures that match the clue and an “X” on the pictures that do not match the clue. After all the clues have been read, ask students to circle the picture that is the best guess (i.e., fits all the clues). Repeat the procedure until all three mysteries have been solved.

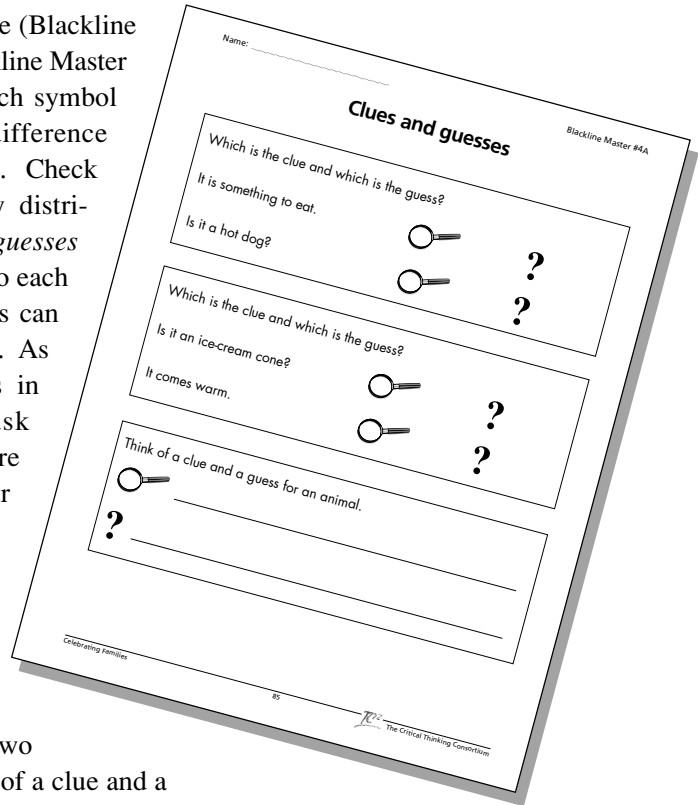


Anticipate next class

- Congratulate students on learning to be good detectives. Explain to students that tomorrow they are going to look for clues and make guesses about the mystery box. Leave the box in a visible place and encourage students to examine it for possible clues that might help in guessing its contents. Perhaps put a magnifying glass near the box or several pair of pretend binoculars (toilet paper rolls taped together) to encourage students to look for details about the box.

Check understanding of concepts

- Point to the symbols for clue (Blackline Master #1) and guess (Blackline Master #2). Ask students what each symbol means and what is the difference between a clue and a guess. Check students' understanding by distributing copies of *Clues and guesses* (Blackline Master #4A-B) to each student. The first two boxes can be done with the entire class. As you read aloud the words in each of these boxes, ask students to circle the picture that matches the idea. Your handling of the rest of the boxes will depend on students' ability to print and on the presence of teaching assistants, parents or older student volunteers. In the next two boxes, students are to think of a clue and a guess for an animal and a room in their home and tell the answer to someone who will record their answer. In the final box, ask students to put in words their understanding of the terms "clue" and "guess". Afterwards, invite students to share the words they used to explain a clue and a guess (e.g., clues are hints, they help us figure out a mystery; guesses are our ideas about the answer to the mystery, but we may not be sure). Print these definitions or attributes on the board underneath the clue and guess symbols.



Record clues for mystery box

- Draw attention to the mystery box. Ask students if they can think of any clues that might help in figuring out what is in the box (e.g., shape, size, weight, sound when shaken, feel [solid/loose]). As indicated on the following page, record their suggested clues along the top row of a chart beneath the "clue" symbol. If students offer guesses rather than clues, record them in the "guesses" column of the chart and reinforce the distinction between a guess and a clue. If students are unable to generate clues, prompt them with questions such as:
 - What can we tell by looking? (size, shape)
 - What can we tell by touching? (weight)
 - What can we tell by shaking? (sound)

Generate silly guesses

- Suggest that the box might include a fridge. Ask students if this seems reasonable. Offer another silly guess such as it might contain a hippopotamus. Pretend you do not understand the process of using clues to generate guesses and invite students to teach you how to check your guesses against the clues.

The mystery box

Making a guess



Looking for clues



Could it be...?	size: small	shape: a box	weight: light	sound: rattles
<i>fridge</i>	X	✓	X	X
<i>hippopotamus</i>	X	X	X	X

Generate guesses

- Ask students if there is one thing or many things in the box and why they think so. Invite each student in turn to offer a reasonable guess as one thing that might be in the box. Print or draw their answers on the chart. (Recording the student’s name next to each guess will help later in documenting students’ understanding.) Check each guess against all of the clues.

Provide additional clues

- Suggest that more clues may be needed to guess what is in the box. One at a time, provide verbal clues. Invite students to ask questions to generate more clues. Add the new clues along the top of the chart. Possible clues may include:
 - The things in the box belong to me.
 - Looking at these things makes me emotional (happy and sad).
 - Some of these things help me remember special people or important times.
 - I might carry some of these things in my wallet.
 - I might put one of these things on a wall or shelf at home.

Consider new clues

- Record the new clues and invite students to generate further guesses based on these clues. Record the new guesses (with students’ names) and check them against the clues. You may want to check some of the old guesses against newly posted clues.

Present the critical challenge

- When guesses are exhausted or many reasonable guesses have been suggested, ask students to consider the guesses and think about their best guess. Present the critical task:

Based on all the clues, guess one of the things in the mystery box.

Provide students with a copy of *My best guess* (Blackline Master #5) and ask students individually or with a partner to draw a best guess about one or more of the contents of the box and print the answer and a reason why.

The image shows a blackline master worksheet titled "My best guess" (Blackline Master #5). At the top left, there is a line for "Name: _____". The main part of the worksheet is a large rectangular box for drawing. Below the drawing box, there are two lines of text: "I think there is _____ in the box" and "because _____". At the bottom of the page, there is a small logo for "The Critical Thinking Consortium" and the text "Celebrating Families" and "87".

Open the mystery box

- When all students have made their guesses, open the box and examine the contents one by one. Explain the significance of some of the items. Determine if any of the best guesses match the objects in the box. After sharing the contents ask students to guess what all the objects have in common. Explain that this is a family treasure box containing pictures and objects that have special meaning for you and your family. Mention that students will be creating their own family treasure box as they learn more about families.

Assess key understandings

➤ Use the rubric *Assessing clues and guesses* (Blackline Master #6) to assess students’ understanding of “clue” and “guess” and their ability to recognize and offer guesses. The sources of evidence for each of four criteria on this rubric are listed below:

- use responses on *Clues and guesses* (Blackline Master #4A-B) to assess their understanding of the concepts of “clue” and “guess”;
- use responses on *Solving the mystery* (Blackline Master #3A-B) to assess their ability to recognize reasonable guesses;
- use student-generated guesses recorded on “The mystery box” chart to assess their ability to offer a reasonable guess;
- use responses on *My best guess* (Blackline Master #5) to assess their ability to offer and explain a “best guess”.

Use the results of these assessments to decide about the level of support students will require in the next two challenges. Reaching the “basic understanding” level on the rubric may be an appropriate objective for many early primary students.

Blackline Master #6

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	Pre-recognition	Partial recognition	Basic understanding	Extended understanding	Sophisticated understanding
Understands “clue” and “guess”	Cannot offer a label for the terms “clue” or “guess” when given a simple example of each.	Correctly identifies only one of the terms when given simple examples of a clue and a guess.	Correctly identifies both terms when given simple examples of a clue and a guess.	Correctly identifies both terms when given simple examples, and provides an example of a clue and a guess.	Correctly identifies both terms when given simple examples, and correctly states in own words the difference between a clue and a guess.
Recognizes reasonable guesses	Cannot select a guess from limited choices when given a clue.	Selects an unreasonable guess from limited choices when given a clue.	Selects reasonable guesses from several options based on one clue.	Successfully selects reasonable guesses based on a pair of clues.	Successfully selects the most reasonable guess from several options based on more than two clues.
Offers reasonable guesses	Cannot come up with a guess when given a clue.	Provides a guess that does not seem to be motivated by the clue (is wild guess).	Provides a guess that matches an obvious clue.	Provides two or more guesses that match an obvious clue and can explain why.	Provides reasonable guesses even with less obvious clues and explains why.
Decides upon a best guess	Unable to identify a best guess.	Offers a best guess that is not very reasonable.	Offers a reasonable, but obvious, best guess explanation.	Offers a reasonable best guess with a simple explanation.	Offers a reasonable best guess and explains its merits relative to other reasonable guesses.
Comments:					

Name: _____

Looking for clues



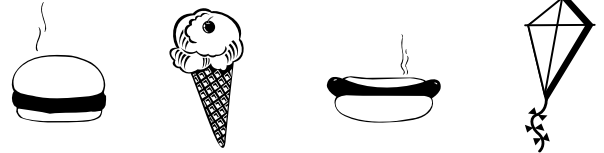
Making a guess



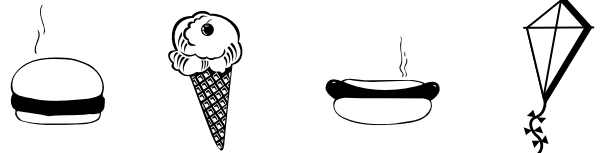
Solving the mystery



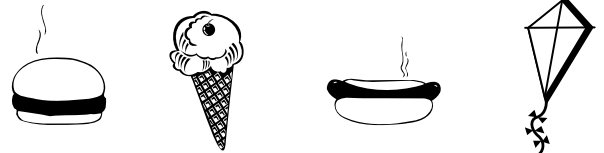
It is something to eat.



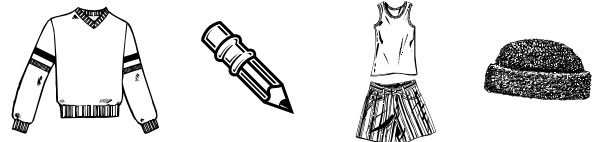
It comes warm.



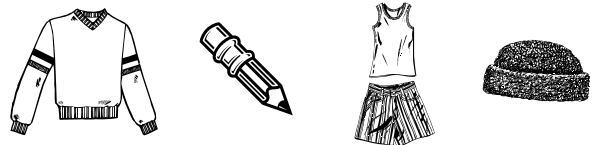
It is long and skinny.



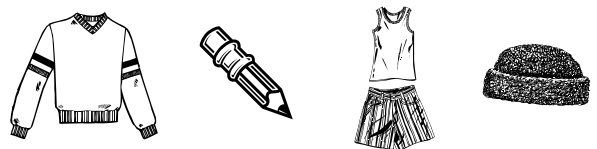
You wear this.



You wear this to keep warm.

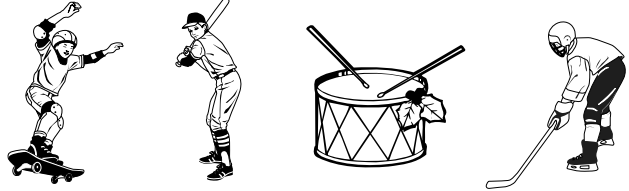


You wear this on your head.

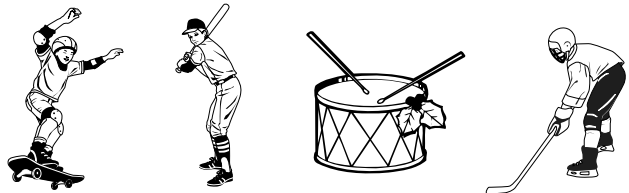




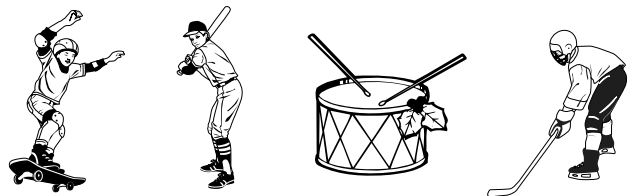
It is fun to do.



It is a game.



You wear skates to play the game.



Clues and guesses

Which is the clue and which is the guess?

It is something to eat.



?

Is it a hot dog?



?

Which is the clue and which is the guess?

Is it an ice-cream cone?



?

It comes warm.



?

Think of a clue and a guess for an animal.



?

Think of a clue and a guess for a room at home.





Explain the words.



A guess is _____



A clue is _____

My best guess

I think there is _____ in the box

because _____

Assessing clues and guesses

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Comments: