Maths Book Club @HKU

Emily Sum & Antonia Yip

March 2, 2020

Connecting language & mathematics

- Learning mathematical language in bilingual mathematics classroom should go beyond vocabulary and technical usage, students should participate in a community where they lean to mathematize situations and to use language to communicate about the situations (Moschkovich, 1996).
- Simply decoding words/ extracting arithmetic operations is not enough, students must learn to read between lines and understand what they are expected to do mathematically.
- Storytelling as a pedagogical practice focus on developing students' mathematical concept and academic literacy that affords students to make sense of the problems and persevere in solving them.
  - Listen to a story
  - Make sense of the story
  - Think about important quantities within the story
  - Retell the story

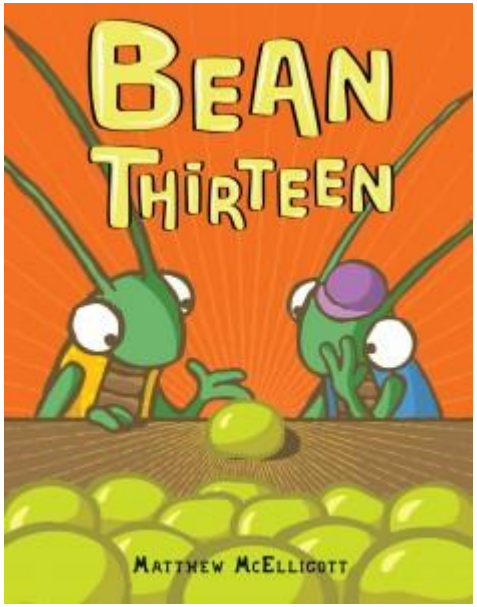
Storytelling

- Address the different meanings possible when participants come from diverse linguistic and cultural backgrounds.
- Provide a semantic structure that engages students in understanding, mathematizing, analysing and communicating in a meaningful context.
- Support the conceptual understanding of mathematical problems and structure (scenario, information and question), through reading, listening, speaking and writing.
- Make mathematical tasks accessible to students at all levels of language development.
- Use multiple representations in stories to support comprehension in problem solving, understanding textual information and data.
- Use different tools for solving problems, comparing different strategies and identifying efficient ones, and communicating mathematical thinking by using drawings, symbols, and written representation (Celedón-Pattichis & Musanti, 2014)

Problems in Context

- Posing problems within a meaningful context through storybooks is a way to make mathematics relevant and helps students to link their knowledge to different situations.
- The problem-solving context is much more convincing when it occurs naturally as part of the story, and teachers can take story characters out of the books into the classroom and to create mathematical problems.
- Students can relate to the word problems in the story (or problems of characters might encounter) with their own experiences, and use their knowledge/experiences in solving word problems.

Bean Thirteen



Ralph warns Flora not to pick that thirteenth bean. Everyone knows it's unlucky. Now that they're stuck with it, how can they make it disappear? If they each eat half the beans, there's still one left over. And if they invite a friend over, they each eat four beans, but there's still one left over! And four friends could each eat three beans, but there's still one left over! How will they escape the curse of Bean Thirteen?

Digital storytelling

https://www.youtube.com/watch?v=sSKx9zwBUNw

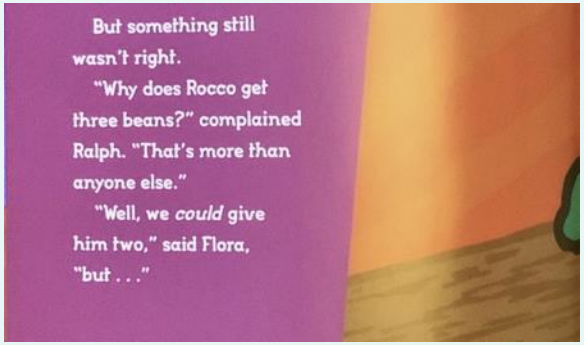
English Language Learning Targets of Key Stage 1 (P1-3)

(extracted from English Language Education Key Learning Area Curriculum Guide (P1 – S6), 2017)

Interpersonal Strand	Knowledge Strand	Experience Strand
To converse about feelings, interest and experiences	To recognize and solve simple problems in given situations	To respond to characters and events in simple imaginative and other narrative texts through oral, written or performative means such as: • making predictions • making simple evaluative remarks • drawing pictures, making simple models or objects • creating captions • describing one's related experiences • participating in the telling of stories

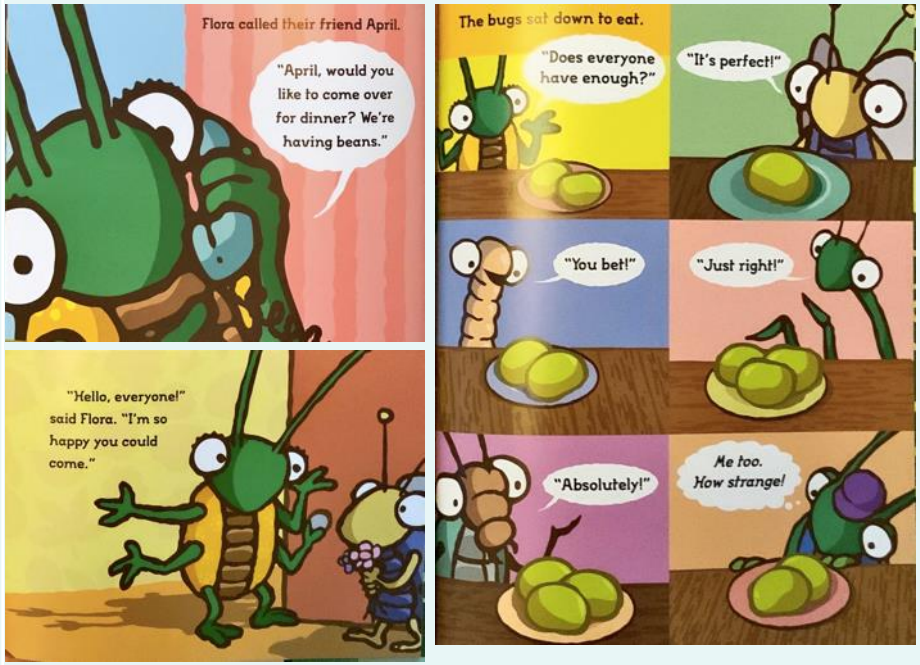
Language Items for Key Stage 1 (P1-3)

(extracted from English Language Education Key Learning Area Curriculum Guide (P1 – S6), 2017)

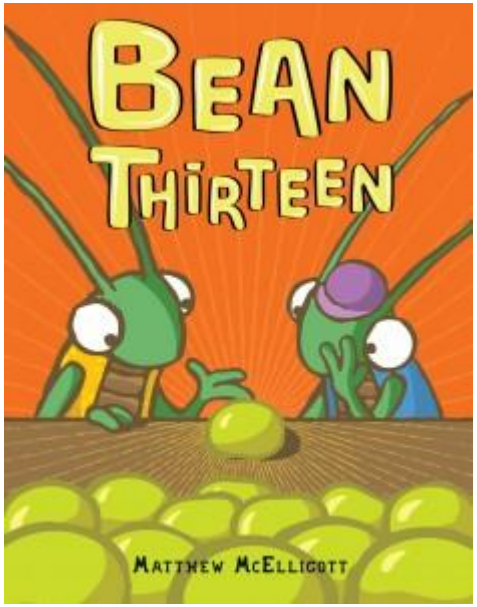
	Examples
Use the plural form of countable nouns to refer to more than one person, animal, event and object	
Use the general determiners "a lot of, all, any, every, many, more, most, much, no, some" to show quantities	
Use the interrogative adverbs "how, when, where" to ask about quantities	

Language Items for Key Stage 1 (P1-3)

(extracted from English Language Education Key Learning Area Curriculum Guide (P1 – S6), 2017)

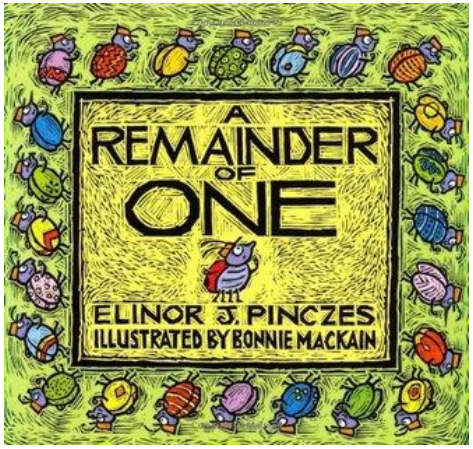
	Examples
Use the simple past tense to describe activities or events in a story	
Use formulaic expressions to • greet people and respond to greetings • offer invitations • express approval or encouragement	

Bean Thirteen

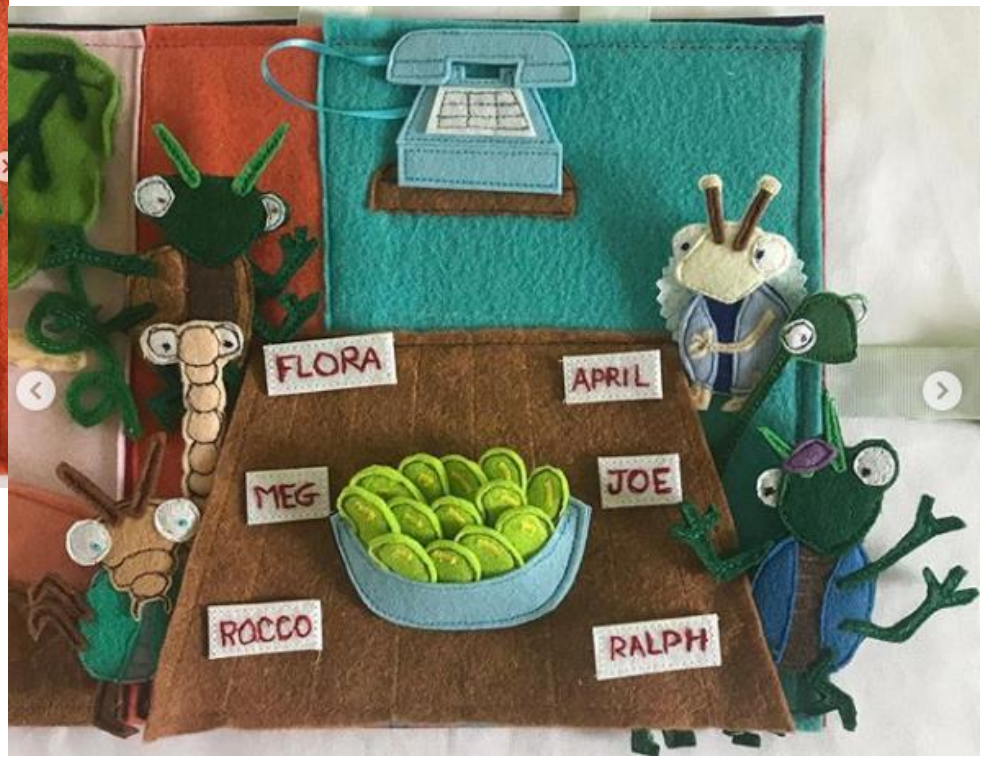


Learning Objectives:

- Number sense;
- Division (equal shares) with remainders.
- Prime numbers



Bean Thirteen

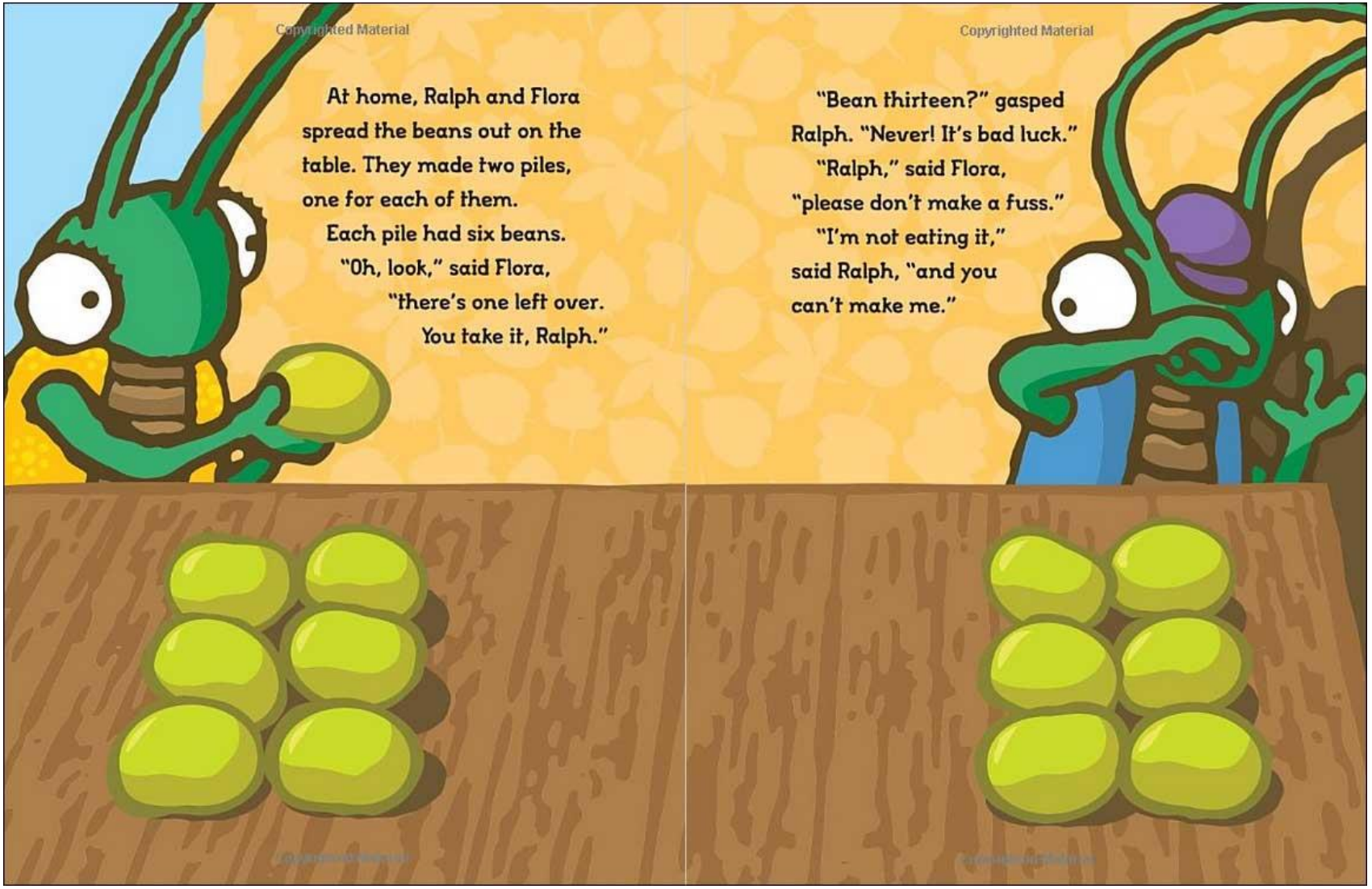


https://www.instagram.com/p/ByxnfGuFcjq/?utm_source=ig_web_copy_link

It was a warm
summer night.
Ralph and Flora
were picking beans
for dinner.

Unlucky Number

Bad Luck

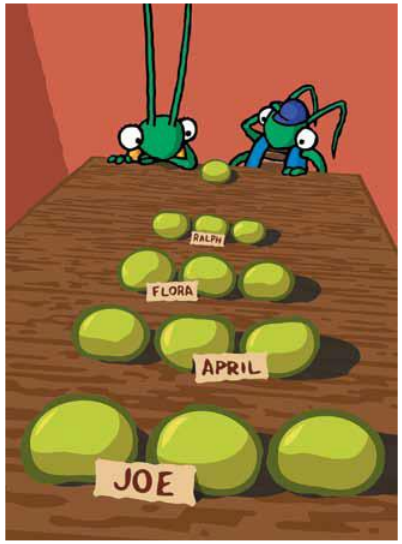

Copyrighted Material
At home, Ralph and Flora spread the beans out on the table. They made two piles, one for each of them.
Each pile had six beans.
"Oh, look," said Flora, "there's one left over. You take it, Ralph."
Copyrighted Material
"Bean thirteen?" gasped Ralph. "Never! It's bad luck."
"Ralph," said Flora, "please don't make a fuss."
"I'm not eating it," said Ralph, "and you can't make me."

Bean Thirteen

"I don't understand," said Ralph. "We're only going to feed April one bean?"

"Of course not," said Flora. "We'll make three piles."

Ask students to predict what will happen next … to make mathematical conjectures.

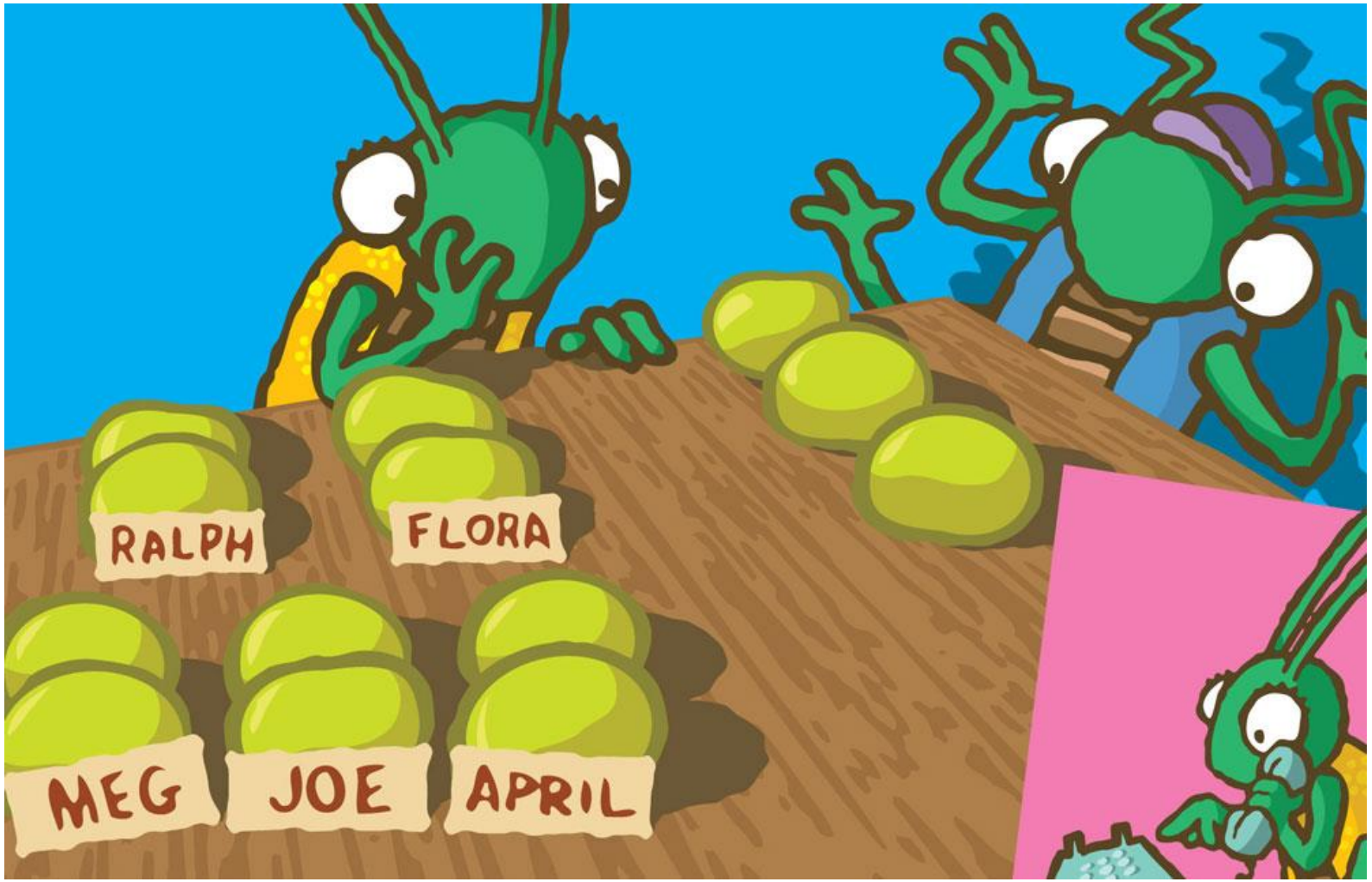


I don't understand," said Flora.

"I do," said Ralph. "Bean thirteen is trouble."

"It's just a bean," said Flora.

Fair Share



This time there were three beans left over.

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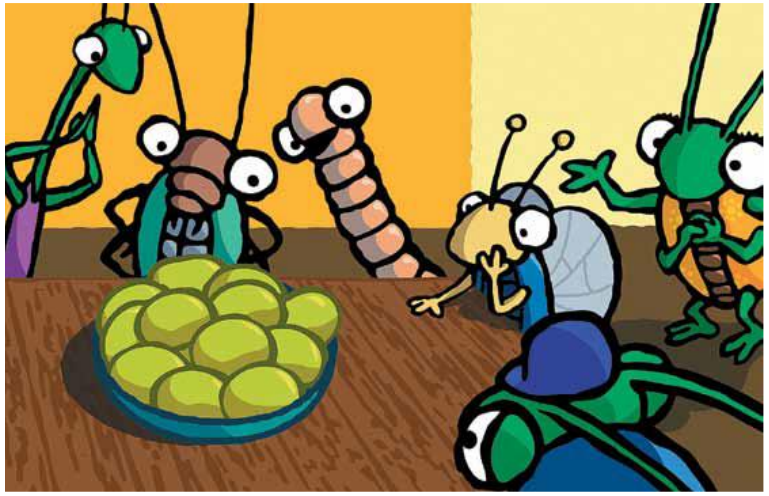


What happened to bean thirteen?

Sharing Beans with Friends

FIGURE 1

A full-size, blank recording sheet accompanies the online article.

Number of Friends	Drawing of Friends' Equal Shares	Extra Beans	Number Sentence
2	RALPH, FLORA	1	6+6+1=13
3	RALPH, FLORA, APRIL	1	4+4+4+1=13
4	RALPH, FLORA, APRIL, JOE	1	3+3+3+3+1=13
5	RALPH, FLORA, APRIL, JOE, MEG	3	2+2+2+2+2+3=13
6	RALPH, FLORA, APRIL, JOE, MEG, ROCCO	1	2+2+2+2+2+2+1=13

Students represent their mathematical findings with concrete objects (actual beans), drawings, verbal explanations, and written number sentences.

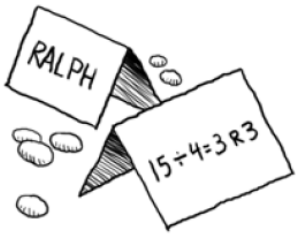
BEAN MATH

Materials:
20 manipulatives (beans) and 10 index cards for each pair of students. Real beans are great if you can get them.

Beans Between

Odd and Even Numbers (2nd grade)

Preparation:
Divide students into pairs and give each pair a set of twenty beans, two index cards, and a piece of paper. Have the students draw a line down the middle of the paper and write "Odd" on one side and "Even" on the other. Then have each student write his/her name on an index card and fold it over so it stands like a place setting. Count out ten beans.



Activity:
Have the students divide the ten beans between them, one bean at a time. They should make two piles, one

Activity:
For this project, students act out the plot of Bean Thirteen, but this time with fifteen beans. Select one of each pair of students to be the first "guest". If there is only one person at the party, how many beans would he/she get? Have the student write the division fact on the back of his/her place card (15 ÷ 1 = 15).

Next, add another guest (the other student in the pair) to the party. Divide the beans again. How many beans would each guest get? Are there any left over? Write this fact on the back of the second guest's card (15 ÷ 2 = 7 R 1)

Now the students can alternate, pretending to invite other guests to the party (friends, relatives, celebrities, etc.) Each time they add a guest, they should make a place card, divide the beans, and write the division fact on the back. Repeat this, continuing to add another guest each time.

Activity:

Students act out the plot of *Bean Thirteen*, but this time with *n* beans.

Support students' learning

1. Provide opportunities for students to retell /reconstruct the stories;
2. Ask students to identify important information in the narrative; solve the problems and share their ideas and strategies, "*Show us.*";
3. Help students to verbalize their mathematical thinking and reasoning;

References

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