Engagement Image to Launch Task

Teachers use this resource to pique student curiosity.

Instructional

Frogs and Flies

There is a frog sitting on a lily pad. First, the frog eats 5 flies. Next, the frog eats 5 flies. Last, the frog eats 5 flies. How many total flies does the frog eat? Show all your mathematical thinking.

Frogs and Flies

Task
There is a frog sitting on a lily pad. First, the frog eats 5 flies. Next, the frog eats 5 flies. Last, the frog eats 5 flies. How many total flies does the frog eat? Show all your mathematical thinking.

Alternative Versions of the Task

More Accessible Version:
There is a frog sitting on a lily pad. First, the frog eats 3 flies. Next, the frog eats 3 flies. Last, the frog eats 3 flies. How many total flies does the frog eat? Show all your mathematical thinking.

More Challenging Version:
There is a frog sitting on a lily pad. First, the frog eats 8 flies. Next, the frog eats 8 flies. Last, the frog eats 8 flies. How many total flies does the frog eat? Show all your mathematical thinking.

Common Core Content Standards and Evidence

1.OA Operations and Algebraic Thinking
Represent and solve problems involving addition and subtraction.

> 2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Exemplars Task-Specific Evidence
This task requires students to solve word problems that require addition of three whole numbers and to add, combine and count on. Students must also have number sense to 15 and the ability to recognize duration (first, next, last).

Underlying Mathematical Concepts
- Number sense to 15
- Counting on/Addition
- First, next, last

Possible Problem-Solving Strategies
- Model (manipulatives)
- Diagram/Key
- Tally Chart
- Table
- Number line

Possible Mathematical Vocabulary/Symbolic Representation
- Model
- Diagram/Key
- Tally chart
- Table
- First, next, last
- More than (>)/Greater than (>)/Less than (<)
- Equivalent/Equal to
- Equal shares
- Odd/Even

Possible Solutions

Original Version:

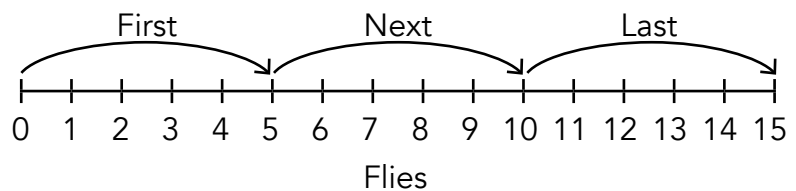The frog eats a total of 15 flies.

Key
f is 1 fly

Time	Total Flies
First	5
Next	10
Last	15

Time	Flies
First	5
Next	5
Last	5

Time	Flies
First	卌
Next	卌
Last	卌

First   Next   Last

f f f f f   f f f f f   f f f f f

5 + 5 + 5 = 15

5 + 5 + 5 = 15

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Flies

More Accessible Version:

The frog eats a total of 9 flies.

More Challenging Version:

The frog eats a total of 24 flies.

Instructional

Possible Connections
Below are some examples of mathematical connections. Your students may discover some that are not on this list.

- There is an equal amount of flies eaten each day.
- The frog ate an odd number of flies each day.
- Relate to a similar task and state a math link.
- Solve more than one way to verify the answer.
- An equation is 5 + 5 + 5 = 15
- 15 is an odd number answer.
- The frog does not eat any more flies, because the task uses the terms first, next, last.
- The running total is 5, 10, 15 flies, or Odd, Even, Odd flies.
- The running total is a +5 pattern.

Instructional

Engagement Image to Launch Task

Teachers use this resource to pique student curiosity.

Summative Assessment

A New Fish Tank

Erin has a new fish tank. First, Erin puts five fish in the new fish tank. Next, Erin puts six fish in the new fish tank. Last, Erin puts nine fish in the new fish tank. How many fish does Erin put in the new fish tank? Show all your mathematical thinking.

Summative Assessment

A New Fish Tank

Common Core Task Alignments
Mathematical Practices: 1, 3, 4, 6,
Grade 1 Content Standards: 1.OA.A.2

Task

Erin has a new fish tank. First, Erin puts five fish in the new fish tank. Next, Erin puts six fish in the new fish tank. Last, Erin puts nine fish in the new fish tank. How many fish does Erin put in the new fish tank? Show all your mathematical thinking.

Common Core Content Standards and Evidence

1.OA Operations and Algebraic Thinking
Represent and solve problems involving addition and subtraction.

2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Exemplars Task-Specific Evidence
This task requires students to solve word problems that require addition of three whole numbers whose sum is less than or equal to 20. Students also need to be able to recognize duration (first, next and last).

Underlying Mathematical Concepts
- Number sense to 20
- Addition of three addends
- First, next, last (duration)

Possible Problem-Solving Strategies
- Model (manipulatives)
- Diagram/Key
- Tally chart
- Table
- Chart
- Number line

## Possible Mathematical Vocabulary/Symbolic Representation
- Model
- Diagram/Key
- Table
- Chart
- Tally chart
- Number line

Summative Assessment

Possible Mathematical Vocabulary/Symbolic Representation (cont.)

- First, next, last
- Sets
- More than (>)/Greater than (>)/Less than (<)
- Equivalent/Equal to
- Most/Least
- Odd/Even
- Equation
- Equality
- Total/Sum
- Half dozen

Possible Solutions

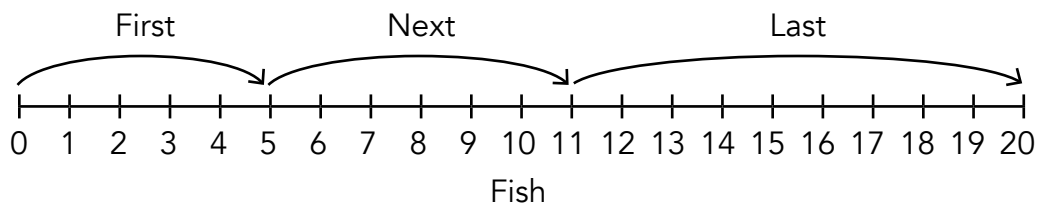Erin put 20 fish in the new fish tank.

Key
⋈ is 1 fish

Fish
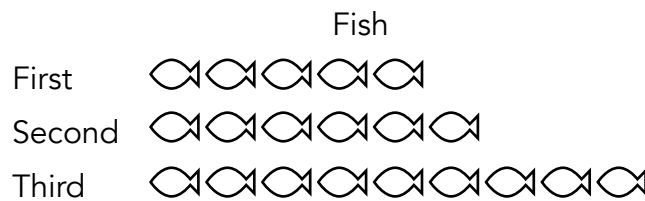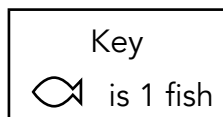
First ⋈⋈⋈⋈⋈
Second ⋈⋈⋈⋈⋈⋈
Third ⋈⋈⋈⋈⋈⋈⋈⋈⋈

Order	Fish
First	|||||
Next	|||||	
Last	||||| ||||

Order	Fish
First	5
Next	6
Last	9

$5 + 6 + 9 = 20$

Order	Total Fish
First	5
Next	11
Last	20

First · Next · Last

```
 0  1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16 17 18 19 20
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Fish

Summative Assessment

Possible Connections

Below are some examples of mathematical connections. Your students may discover some that are not on this list.

- Erin put the least fish in first (5).
- Erin put the most fish in last (9).
- Solve more than one way to verify the answer.
- Relate to a similar task and state a math link.
- Odd + Even + Odd = Even.
- Erin has 3 sets of fish.
- 6 fish is a half dozen.
- Erin put 1 less fish in first than second.
- Erin put 4 more fish in last than first.
- 20 total fish is an even number of fish.
- 5 is less than 6, 6 is less than 9.
- 6 is greater than 5, 9 is greater than 6.

Novice Scoring Rationales

Criteria and Performance Level	Assessment Rationales
Problem Solving *Apprentice*	The student's strategy of diagramming the fish in the new fish tank would work to solve the task, but the student does not indicate the correct number of fish. The student's answer, "I got twenty-one fish," is incorrect.
Reasoning Proof *Practitioner*	The student shows correct reasoning of the underlying concept of combining three addends to find a sum. The student states, "I put them all in the tank-five, six, nine, fish." The student makes a calculation error of including one extra fish in the tank, which leads to an incorrect answer.
Communication *Novice*	The student does not use any mathematical language.
Connections *Novice*	The student does not make any mathematically relevant observation about her/his solution.
Representation *Apprentice*	The student's diagram of the fish tank and fish is appropriate to the problem but not accurate. The tank should only include twenty fish. The student's scribing defines the fish tank and the fish.

Summative Assessment

Novice
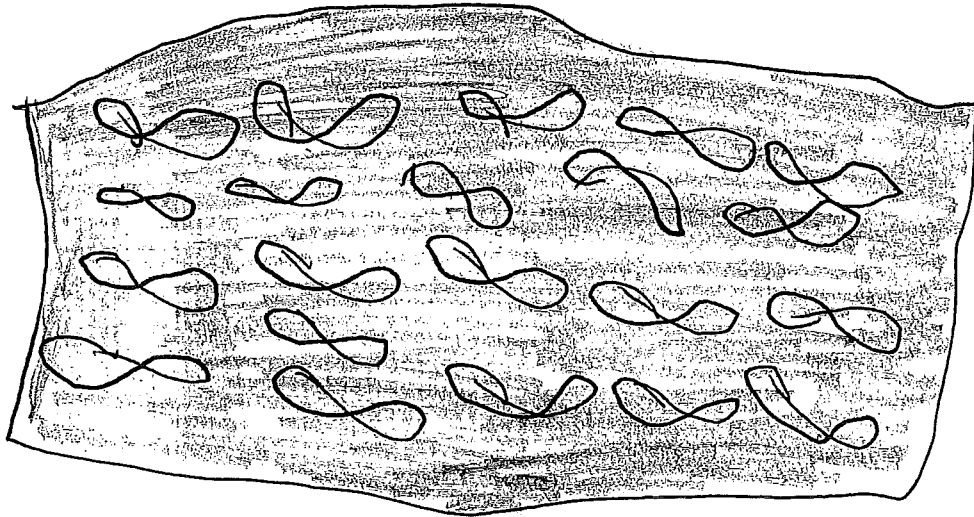
"I put them all in the tank–5, 6, 9 fish.
I got 21 fish (counted 1,2,3...21)"
[How did you know to stop?]
"I counted to 21." A2

Summative Assessment
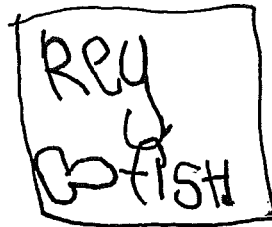
Apprentice Scoring Rationales, Student 1

Criteria and Performance Level	Assessment Rationales
Problem Solving *Apprentice*	The student's strategy of diagramming the fish in the new fish tank would work to solve the task, but the student does not indicate the correct number of fish. The student's answer, "19," is incorrect.
Reasoning Proof *Practitioner*	The student shows correct reasoning of the underlying concept of adding three addends to find a sum. The student omits one fish in her/his diagram, which leads to a calculation error. This is not considered a flaw in the student's reasoning but an error in addition.
Communication *Practitioner*	The student correctly uses the mathematical terms *diagram* and *key*.
Connections *Novice*	The student does not make any mathematically relevant observation about her/his solution.
Representation *Apprentice*	The student's diagram of the fish is appropriate to the problem, but not accurate. The tank should include twenty fish. The student's key defines the fish.
Notes	The overall achievement level for this piece of student work falls under Exemplars exception to the rule category. If a student has all Apprentice scores or above, but a Novice in "Connections," the student may still receive an achievement level score of Apprentice.

Summative Assessment

Apprentice, Student 1

P/S	R/P	Com	Con	Rep	A/Level
A	P	P	N	A	A

Count the fish. I can do a diagram

Key
🐟 = fish

🐟 🐟 🐟 🐟 🐟 5

🐟 🐟 🐟 🐟 🐟 🐟 6

🐟 🐟 🐟 🐟 🐟 🐟 🐟 🐟 9

"There are 19 fish that Erin puts in the fish tank." A2

⑲

Apprentice Scoring Rationales, Student 2

Criteria and Performance Level	Assessment Rationales
Problem Solving *Practitioner*	The student's strategy of using a table to record the number of fish in the order they were put in the new fish tank and then using an equation and tally marks to find a total of twenty fish works to solve the task. The student's answer, "20," is correct.
Reasoning Proof *Practitioner*	The student shows correct reasoning of the underlying concept of using three addends to find a sum.
Communication *Practitioner*	The student correctly uses the mathematical terms *table*, *first*, *next*, *last*.
Connections *Novice*	The student does not make any mathematically relevant observation about her/his solution.
Representation *Practitioner*	The student's table is appropriate to the problem and accurate. Each column is correctly labeled and all data is correct. The tallies above the equation support the data in the table, and are used to find the sum.
Notes	The overall achievement level for this piece of student work falls under Exemplars exception to the rule category. If a student has all Apprentice scores or above, but a Novice in "Connections," the student may still receive an achievement level score of Apprentice.

Summative Assessment

P/S	R/P	Com	Con	Rep	A/Level
P	P	P	N	P	A

I can make a table.

order	fish
first	5
next	6
last	9

5
✝✝✝
5 +

10
✝✝✝ i
6 +

15
✝✝✝ iiii
9 = 20

20

Practitioner Scoring Rationales, Student 1

Criteria and Performance Level	Assessment Rationales
Problem Solving *Practitioner*	The student's strategy of using a table to record the number of fish in the order they were put in the new fish tank works to solve the task. The student's answer, "20 fish," is correct.
Reasoning Proof *Practitioner*	The student shows correct reasoning of the underlying concept of using three addends to find a sum.
Communication *Practitioner*	The student correctly uses the mathematical terms *tally chart*, *tally*, *total*, *most*, *least*, *more*, *less*.
Connections *Practitioner*	The student makes the mathematically relevant observations, "nine is most fish put in," "five is least fish put in," and, "Most and least are our new words. It is like more and less fish."
Representation *Practitioner*	The student's tally chart is appropriate to the problem and accurate. Each column is correctly labeled and all data is correct.

Summative Assessment

P/S	R/P	Com	Con	Rep	A/Level
P	P	P	P	P	P

Find how many fish.
I will make a tally chart

fish

fish	tally	total fish
5	IIII	5
6	IIIII I	11
9	IIIII IIIII	20

A:
20
fish

9 is most fish put in.
5 is least fish put in.

"Most and least are our new words. It is like more and less fish." A2

Practitioner Scoring Rationales, Student 2

Criteria and Performance Level	Assessment Rationales
Problem Solving *Practitioner*	The student's strategy of using a diagram to show the number of fish in the order they were put in the new fish tank works to solve the task. The student's answer, "It is 20 fish," is correct.
Reasoning Proof *Practitioner*	The student shows correct reasoning of the underlying concept of using three addends to find a sum.
Communication *Practitioner*	The student correctly uses the mathematical terms *diagram*, *key*, *first*, *next*, *last*, *most*, *least*.
Connections *Practitioner*	The student makes the mathematically relevant observations, "nine is the most," and, "five is the least fish in the tank."
Representation *Practitioner*	The student's diagram is appropriate to the problem and accurate. A key defines the fish. The scribing also provides labels for the fish and the tank.

Summative Assessment

Practitioner, Student 2

Do a diagram.

Hey f—fish

It is 20 fish

first f f f f f ⑤

next f f f f f f Ⓖ

last f f f f f f f f ⑨

9 is the most fish

"I did a diagram of 5 fish, 6 fish, 9 fish
9 is the most, 5 is the least fish in the tank."

A 2

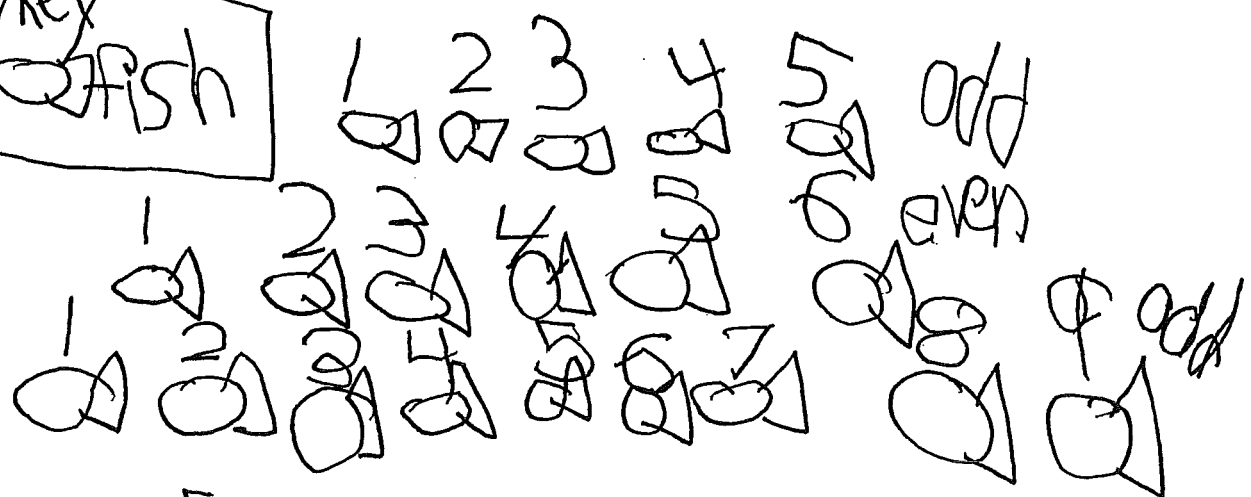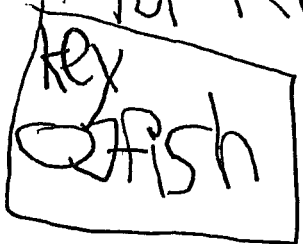Summative Assessment

Expert Scoring Rationales

Criteria and Performance Level	Assessment Rationales
Problem Solving *Expert*	The student's strategy of using a diagram to show the number of fish in the order they were put in the new fish tank works to solve the problem. The student's answer, "20 fish," is correct. The student includes odd and even numbers in her/his solution as well as verifying her/his solution with a table.
Reasoning Proof *Expert*	The student shows correct reasoning of the underlying concept of using three addends to find a sum. The student also brings the concept of odd, even, greater than, less than, and using a table to verify her/his answer to her/his solution.
Communication *Expert*	The student correctly uses the mathematical terms *diagram*, *key*, *odd*, *even*, *equation*, *number sentence*, *more*, *number*, *table*, *time*, *first*, *next*, *last*, *total*, *tens*, *less than*. The student correctly uses the mathematical notation <.
Connections *Expert*	The student makes the mathematically relevant Practitioner observations, "Each time she put more fish in the tank-five, six, nine, fish." The student also notes that five is odd, six is even, and nine is odd. The student makes the Expert connections of using a table to verify that her/his answer is correct. The student states, "I did a table to show a new plan to get 20 fish." The student also reflects on the duration terms used in the problem and states, "It says last so she isn't going to put more fish in the tank." The student uses the mathematical notation for less than to indicate that five is less than six and six is less than nine.
Representation *Expert*	The student's diagram is appropriate to the task and accurate. A key defines the fish. The student's table is appropriate to the task and accurate. All necessary labels are provided and the entered data is correct. The student uses the table to verify that her/his answer is correct.

Summative Assessment

P/S	R/P	Com	Con	Rep	A/Level
E	E	E	E	E	E

Count all the fish.
Make a diagram.

key
fish

1 2 3 4 5 odd
6 even

1 2 3 4 5 6 7 8 φ odd
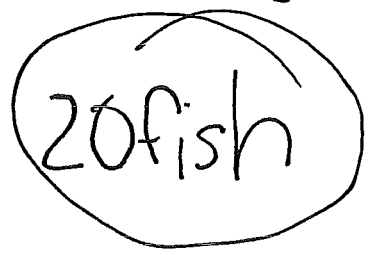
1 2 3 4 5 6 7

$5 + 6 + 7 + 9 = 20$

"This is called an equation
or you can say number
sentence if you want too."

"each time she put more fish
in the tank – 5,6,9 fish."
20 is an even number of fish."

" I can make a table to do
a new plan." A2

20 fish

"I see five is less than 6 and 6 is less than 9."

$5 < 8$

$6 < 9$

"That is what this says!"

time	fish	total fish
first	5	5
Next	8	11
Last	9	20

$5 + 8 + 9 = 20$

20 is 20. I am corect.

"I did a table to show a new plan to get 20 fish. I like doing tables. I know 20 fish is like two tens 10-20, 20 fish.
It says last so she isn't going to put more fish in the tank." A2