SOLVING WORD PROBLEMS
/INSTRUCTOR INFO

Summary

This lesson includes vocabulary, content, and examples to help students learn and   understand basic operations. Using addition, subtraction, multiplication, and division, students will solve real world problems using OCEARCH data by identifying mathematics in everyday life.

Part 1.   Basic Operations
Part 2.   Strategies for Solving Word Problems
Part 3.   Student Review
Part 4.   In Class Examples
Activity 1.   Foraging Game
Activity 2.   Creating Word Problems

Goals & Objectives

The students will:
• Use addition, subtraction, multiplication, and division to solve word problems;
• Understand and use different strategies for solving word problems;
• Solve multiple step word problems using the four operations;
• Apply mathematics to every-day life problems.

Helpful Tips

1.   The content in this lesson is based on the conservation work of OCEARCH™ and the Global Shark Tracker™. Spend a few minutes getting familiar with the website and the tracker if you have not done so already. The Global Shark Tracker™ is also available as an app for iPhone and Android
2.   This lesson plan is designed to be adaptable to suit your specific needs. Use the entire lesson plan or just parts of it. This material can be expanded to be an entire unit or condensed for just one day in the classroom.
3.   Vocabulary words will be underlined as they first appear in the lesson plan. A complete list of vocabulary words is included as well.
4.   Answers to questions and prompts for discussions will appear in italics.
5.   Optional activities and content (side notes) will appear in a box. Use these to enhance your lesson and adapt it to suit your needs!
6.   Have questions for OCEARCH Expedition Leader, Chris Fischer? Email info@OCEARCH.org to schedule a Skype session and let your students/child talk directly to Chris and the OCEARCH crew!
7.   Email all questions about this lesson to info@OCEARCH.org.

// STANDARDS

STEM

This lesson plan aims to assist teachers in implementing a STEM-based program into their classroom while inspiring the next generation of explorers, scientists, and stewards of the ocean. Based on real science and the Global Shark Tracker™, "Solving Word Problems" is intended to promote environmental awareness and to prepare students for STEM careers.

This lesson aligns with the following TEKS:

Grade 3 Math: 3A, 3B, 4A, 4B, 4C, 14A, 14B, 14C
Grade 3 Math (Revised): 1A, 1B, 4A, 4B, 4G 4K, 5A, 5B
Grade 4 Math: 3A, 4B, 4C, 4D, 4E, 14A, 14B, 14C
Grade 4 Math (Revised): 1A, 1B, 2D, 4A, 4B, 4C, 4D, 4E, 4F, 4G, 4H
Grade 5 Math: 3A, 3B, 3C, 14A, 14B, 14C
Grade 5 Math (Revised): 1A, 1B, 3A, 3B, 4B

This lesson aligns with the following Common Core Math Standards:

3rd Grade: 3.OA.A.1, 3.OA.A.2, 3.OA.A.3, 3.OA.A.4, 3.OA.A.D.8, 3.NBT.A.1
4th Grade: 4.OA.A.2, 4.OA.A.3, 4.NBT.A.3
5th Grade: 5.NBT.A.3a, 5.NBT.A.4

SOLVING WORD PROBLEMS
/VOCABULARY

Addition – Brining two or more numbers together to make a new total.

Difference – To take one number away from another. Another term for subtraction.

Division – To share or group a number into equal parts.

Multiplication – Repeated addition.

Numbers – Describe quantities or values. Count or measurement.

Problem – A question that needs a solution.

Product – The result when two numbers are multiplied.

Quotient – The number or product resulting from dividing one number by another.

Solution – The answer to a problem.

Solve – To find the answer or work out the answer in a mathematical problem.

Subtraction – To take one number or quantity away from another.

Sum – The result of adding two or more numbers.

Total – The result of adding numbers. The sum or whole amount.

Vocabulary Bingo (15 – 30 minutes)
Try this fun game to practice and review vocabulary words!

Materials – For this game, students will need to make a 4 square by 4 square bingo card with one vocabulary word written in each box, and 16 small objects (torn paper works great!) for place markers. The teacher will need to write the definitions to vocabulary words on slips of paper.

The teacher, or a chosen student, will be the game host. Fold the paper slips and mix together in a bucket, box, hat, etc. Pull a slip and read the definition to the class. If the kids have the corresponding word on their bingo card they can mark it off. Continue reading definitions until a student matches four words in a row. Have the student read their words out loud. If the student is correct and all their words have been called, the student wins! If not, play continues until someone wins. For an added twist, play four corners, black out, or create your own version!

SOLVING WORD PROBLEMS
/PRE-LESSON ASSESSMENT

Use the following true/false, fill in the blank, and multiple-choice questions as an introduction/warm-up to the lesson topics. You can do this in a verbal or written format, as a game, individually, or as a whole class! A handout is provided if you wish to hand the questions out in a quiz format.

The questions do not need to be graded. They are intended to give the students an idea of what they will be learning and to see what they already know.

1. True or False: Multiplication is a shortcut for adding equal groups together.
Answer*: True*

2. True or False: We can make a complicated problem easier by breaking it up into smaller parts.
Answer*: True*

3. True or False: If a question begins with "how many more…" we will need to use addition.
Answer*: False*

4. Which of the following is NOT a basic operation?
    a. subtraction
    b. division
    c. combination
    d. multiplication
Answer: *c*

5. Which of the following are "telling words" for division? Circle all that apply.
    a. each
    b. per
    c. together
    d. remains
Answer(s): *a, b*

6. Which of the following are part of the CUBE method? Circle all that apply.
    a. circle the numbers
    b. box the question
    c. eliminate unnecessary information
    d. underline important words
Answer: *a,b,c,d*

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Pre-Lesson Assessment: Solving Word Problems
Select the correct answer(s) to each of the following questions.

1.   True   or   False

Multiplication is a shortcut for adding equal groups together.

2.   True   or   False

We can make a complicated problem easier by breaking it up into smaller parts.

3.   True   or   False

If a question begins with "how many more…" we will need to use addition.

4. Which of the following is NOT a basic operation?
  a. subtraction
  b. division
  c. combination
  d. multiplication

5. Which of the following are "telling words" for division? Circle all that apply.
  a. each
  b. per
  c. together
  d. remains

6. Which of the following are part of the CUBE method? Circle all that apply.
  a. circle the numbers
  b. box the question
  c. eliminate unnecessary information
  d. underline important words

SOLVING WORD PROBLEMS / LESSON PLAN

PART 1. BASIC OPERATIONS **10-20 mins**

Basic operations are very important to marine scientists who study sharks and the ocean. It is important to be able to use addition, subtraction, multiplication, and division in different scenarios to solve complex problems. Before exploring the rest of this lesson, make sure students understand the four basic operations.

Addition is brining 2 or more numbers together to make a new total. Essentially, taking two or more smaller numbers and counting them together as one large amount.

Subtraction means to take one number or quantity away from another. You are starting with one large amount and ending up with a smaller amount.

Multiplication is the repeated addition of the same number. This is a shortcut for adding equal groups together.

Division is a way to separate a large group into smaller, equal groups. It is the opposite of multiplication.

Fast Math! (10 – 15 minutes)
Practice mental math with this card game.

Materials: One deck of cards

Instructions: Gather everyone in a circle. The teacher will start the game off by calling out one of the operations. The first student with the deck of cards will flip the top two cards over and use mental math to add, subtract, multiply, or divide the two numbers*. For example: If the teacher calls out "addition" and the student flips over a 5 and a 2, he or she will answer with "seven".* When the correct answer is said, the student passes the deck to their neighbor. After the deck of cards completely goes around the circle, the teacher will call out a different operation and play continues.

* Face cards can either be taken out of the deck or used as "wild cards".
* Students may not be able to divide some numbers evenly, instead, students can multiply their numbers.
* For more of a challenge, time how long it takes the deck to make it around the circle. Try to beat the time during the next round.

In school we often see math problems as a bunch of simple, unrelated equations that are pretty straightforward to solve.

$$2 + 2 = 4$$
$$10 - 1 = 9$$
$$2 \times 5 = 10$$
$$8 \div 2 = 4$$

However, marine researchers collect so much data they usually encounter complicated problems requiring different combinations of addition, subtraction, multiplication, and division. These are like complex word problems that can only be solved with strategy and planning ahead.

PART 2. STRATEGIES FOR SOLVING WORD PROBLEMS **15-30 mins**

Look for "Telling Words"

When reading word problems, there are "telling" words (sometime called "hint words" or "clue words") letting us know what operations we need to use to solve the problem. The table below is a list of some of the most common words associated with different operations. Sometimes, one word can tell you to do several things. In that case, you'll have to use other clues to figure out what to do.

Table 1. Common Mathematical Telling Words

Addition	Subtraction	Multiplication	Division	Solution
Add	Take away	Times	Each	Is
Altogether	Difference	Every	Equal	Are
Both	Fewer	At this rate	Equally	Was
In All	How many/much more?	Of	Per	Were
Sum	Left	Product	Separate	Will be
Total	Less	Multiplied	Quotient	Gives
Together	Minus	Doubled, tripled, etc.		Yields
Increased by	Needs to			Equals
	Remains			
	Subtract			

Example 1.

a) The OCEARCH Global Shark Tracker™ is a tool researches to keep track of sharks. One day, two scientists decided to compare locations from the 7 sharks tagged in Chile and the 4 sharks tagged in Montauk, New York. How many more sharks did they look at from Chile than Montauk?

The telling word here is "how many more". This tells us to subtract the sharks tagged in Montauk from the sharks tagged in Chile.

Answer: *7 – 4 = 3*
Chile has three more sharks to look at.

b) While gathering data from the 4 sharks tagged in Montauk, the 2 scientists discovered there was so much information they needed to lighten the work load. How many sharks did each scientist gather data from if the work was divided equally?

This one is easy! What are the clue words, can you guess? *Ask students to call out the "telling" words.* The key words here is "divide" and "equally"!
Answer:
4 ÷ 2 = 2
Each scientist gathered data from 2 sharks.

Find the telling words and solve the problems.

A student handout is provided on pages 17 & 18.

1. Betsy the great white shark swam 30 miles (48.3 km) on Tuesday, 41 miles (66 km) on Wednesday, and 49 miles (78.9 km) on Thursday. How many miles did she swim altogether?
    Telling Word – altogether   Answer – *120 miles (193.2 km)*
2. Pablo is a 5 ft (1.524 m) long immature (meaning not yet full grown) mako shark. If he doubles in length by the time he matures, how long would he be?
    Telling word – doubles   Answer – *10 ft (3.05 m)*
3. Great white sharks can have 6 to 10 pups per litter. If Albertina has given birth 3 times and had a total of 21 pups, how many pups would she average per litter?
    Telling word – per   Answer – *7 pups per litter*

Look for Groups of Similar Items

Sometimes a word problem can have so many different numbers and words, it becomes difficult keeping the information sorted out. This is where grouping comes in. When reading the word problem, look for groups of similar items to help keep things organized.

Example 2.

> Lydia, a white shark, traveled 32 miles (54.5 km) on Sunday, 56 miles (90.1 km) on Monday, 19 miles (30.6 km) on Tuesday, 73 miles (117.5 km) on Wednesday, 67 miles (107.8 km) on Thursday, 37 miles (59.5 km) on Friday, and 23 miles (37.0 km) on Saturday. Beamer the blue shark traveled 22 miles (35.4 km)on Sunday, 3 miles (4.8 km) on Monday, 35 miles (56.3 km) on Tuesday, 29 miles (46.7 km) on Wednesday, 24 miles (38.6 km) on Thursday, 39 miles (62.8 km) on Friday, and 38 miles (61.1 km) on Saturday.
>
> A) How many miles did Lydia travel in a week?
>
> There is a lot of information in this one problem! Luckily for us, the problem is only concerned with how many miles Lydia traveled. We do not even need to worry about Beamer.
>
> Let's group all of Lydia's mileage together:
> 32 miles (54.5 km) on Sunday
> 56 miles (90.1 km) on Monday
> 19 miles (30.6 km) on Tuesday
> 73 miles (117.5 km) on Wednesday
> 67 miles (107.8 km) on Thursday
> 37 miles (59.5 km) on Friday
> 23 miles (37.0 km) on Saturday
>
> Answer: If we add the mileage together we find that *Lydia traveled 307 miles (497 km) in a week.*
>
> B) How many miles did the sharks travel on Wednesday?
>
> This question is only concerned with how many miles the sharks traveled on Wednesday. Let's group that information together.
>
> Lydia traveled 73 miles (117.5 km) on Wednesday
> Beamer traveled 29 miles (46.7 km) on Wednesday
>
> Answer: If we add this together we find that *the sharks traveled a total of 102 miles (164.2 km) on Wednesday.*

Look for groups of similar items to solve the problems.

A student handout is provided on pages 17 & 18.

1. Over the course of one month, white shark Philip ate 3 sea lions, 1 seal, 6 tunas, and 3 mackerels. Another great white, Mary Lee, ate 4 sea lions, 2 seals, 2 tunas, and 1 mackerel.
   a. How many marine creatures did Mary Lee eat during the month?
      4 sea lions
      2 seals   Answer: *9 marine creatures*
      2 tunas
      1 mackerel
   b. How many seals were eaten by the two sharks during the month?
      Philip ate 1 seal   Answer: *3 seals*
      Mary Lee ate 2 seals

2. The OCERACH Global Shark Tracker™ shows 11 sharks that were tagged in US waters. During the OCEARCH team's expeditions to Cape Cod, Massachusetts, 2 great whites were tagged in 2012, and another 2 were tagged in 2013. Also in 2013, 3 bull sharks were tagged in Boca Grande, Florida, and 2 blue sharks and 2 mako sharks were tagged in Montauk, New York. Of the 11 sharks tagged in US waters, how many sharks were tagged in 2013?
      Cape Cod: 2   Answer: *9 sharks were tagged*
      Boca Grande: 3
      Montauk: 4

Use the CUBE Method

The CUBE method is a way to organize information in a word problem. It allows us to focus on the important parts of the problem while keeping in mind the question we are being asked. The CUBE method is easy to remember because it tells us exactly what to do when reading a word problem for the first time.

The CUBE method says:

C – (Circle) the numbers

U – Underline important words

B – | Box | the questions

E – ~~Eliminate~~ unnecessary information

Example 3.

Some sharks like to swim close to the ocean surface. When their dorsal fin (top fin) breaks water their satellite tag "pings" in their location. In one month, we tracked four sharks. Maddox pinged in 6 times, Redemption pinged in 11 times, Sofia pinged in 9 times, and Genie pinged in 15 times. How many total times did the four sharks ping in during the month?

After using the cube method the problem should now look like this:

~~Some sharks like to swim close to the ocean surface. When their dorsal fin (top fin) breaks water their satellite tag "pings" in their location. In one month, we tracked four sharks.~~ Maddox pinged in (6) times, Redemption pinged in (11) times, Sofia pinged in (9) times, and Genie pinged in (15) times. | How many total times did the four sharks ping in during the month? |

We have now identified the numbers, important words, and the question we are trying to answer. Which operation should we use to find the total amount of pings? *Ask the class to answer this question with addition, subtraction, multiplication, or division.* We will need to use addition.
6 + 11 + 9 + 15 = 41
The four sharks pinged in a total of 41 times during the month.

Use the CUBE method to solve the problems.

A student handout is provided on pages 17 & 18.

1. Ms. Miller's 4ᵗʰ grade class is learning all about sharks through OCEARCH. 5 students are studying about shark physiology, 6 students are studying shark habitats, 3 students are studying sharks in the food web, 7 students are studying shark conservation, 4 students are studying sharks in mythology, and 3 students are studying shark migrations. How many students are in Ms. Miller's class?

   ~~Ms. Miller's 4ᵗʰ grade class is learning all about sharks through OCEARCH.~~ ⑤ students ~~are studying about shark~~ ~~physiology,~~ ⑥ students ~~are studying shark habitats,~~ ③ students ~~are studying sharks in the food web,~~ ⑦ students ~~are studying shark conservation,~~ ④ students ~~are studying sharks in mythology,~~ ~~and~~ ③ students ~~are~~ ~~studying shark migrations.~~ | How many students are in Ms. Miller's class? |

   5 + 6 + 3 + 7 + 4 + 3 = 28
   There are 28 students in Ms. Miller's class.

2. The OCEARCH marine vessel was in the Gulf of Panama on January 1. It needed to reach Baltra Island in Galapagos, 950 miles away, 5 days later, on January 6. How many miles per day did the vessel need to travel in order to reach its destination on time?

   ~~The OCEARCH marine vessel was in the Gulf of Panama on January 1.~~ It needed to reach Baltra Island in Galapagos, ⑨⑤⓪ miles away, ⑤ days later, ~~on January 6.~~
   | How many miles per day did the vessel need to travel in order to reach its destination on time? |

   Answer: 950 miles ÷ 5 days = 190 miles per day
   The OCEARCH vessel needed to travel 190 miles per day to reach their destination on time.

Break Up the Problem

Some word problems seem so complex they can be intimidating when read. Many times breaking up a complex problem into smaller pieces will make the problem easier to manage and solve.

Example 4.

   Researchers aboard the OCEARCH vessel tagged 2 sharks in the first week, 3 sharks in the second week, and 1 shark in the third week at sea. The researchers have only 15 minutes to tag and study the sharks, and there are many tests that the researchers could conduct. Each test takes 5 minutes to complete, so they cannot do them all. The OCEARCH researchers need to know how many tests they performed total, between all of the sharks they tagged in the first three weeks.

   Wow! That seems like a lot, but it is easier than you might think. What if we break this big problem up into a few smaller ones?

   Step 1. The first thing we are given is the amount of sharks tagged in the first three weeks.

"…researchers aboard the OCEARCH vessel tag 2 sharks in the first week, 3 sharks in the second week, and 1 shark in the third week…"

The unasked question is, **how many sharks did they tag in the first three weeks?**

This part should be easy – we just need to add up the number of sharks tagged each week.

2+3+1=*6 sharks tagged in the first three weeks*. Okay! Six sharks!

Step 2. Next, we find out that the researchers have only 15 minutes total to work on each shark.

"The researchers have only 15 minutes to tag and study the sharks, and there are many tests that the researchers could conduct."

The unasked question is, **how many tests can the researchers do in 15 minutes (if each test takes five minutes)?**

We do not need to worry about which tests they do, we just need to know how many five minute long tests can be done in the 15 minutes.

15 minutes total ÷ 5 minutes per test = *3 tests per shark*

Step 3. Now we bring it all together!

"The OCEARCH researchers need to know how many tests they performed total, between all of the sharks they tagged in the first three weeks."

We need to break this up a little to bring it all together. We know that there were 6 sharks tagged and each shark had 3 tests performed. Now, we multiply the number of sharks by the number of tests to find how many tests total were performed.

Answer: 6 sharks x 3 tests =*18 tests total*

Good job! We just solved a complicated problem!

Try solving the next example as a class!

Example 5.

There are 104 sharks off the coast of Cape Town, South Africa. From Cape Town, 3 move to Lambert's Bay, 10 move to Pearly Beach, and 14 move to Betty's Bay Marine Protected Area. Of the sharks remaining in Cape Town, one had 3 pups, two had 4 pups each, and 11 had 2 pups each. How many sharks total are now off the coast of Cape Town?

Step 1. The first piece of information we are given is how many sharks left Cape Town.

"From Cape Town, 3 move to Lambert's Bay, 10 move to Pearly Beach, and 14 move to Betty's Bay Marine Protected Area."

3 + 10 + 14 = *27 sharks left Cape Town*

Step 2. The next piece of information we are given is how many sharks were added to Cape Town.

"Of the sharks remaining in Cape Town, one had 3 pups, two had 4 pups each, and 11 had 2 pups each."

1 × 3 = 3 pups
2 × 4 = 8 pups

11 × 2 = 22 pups

3 + 8 + 22 = *33 sharks were born in Cape Town*

Step 3. Now we bring it all together!

"How many sharks total are now off the coast of Cape Town?"

We know there were originally 104 sharks living near Cape Town. To find out how many sharks are currently there we need to subtract the 27 sharks that left and add the 33 sharks that were born.

104 – 27 + 33 = *110 sharks living off the coast of Cape Town, South Africa.*

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STUDENT REVIEW: REFERENCE SHEET

Use this reference sheet to use the strategies you learned to solve word problems.

1. **Look for "Telling" Words**

Addition	Subtraction	Multiplication	Division	Solution
Add	Take away	Times	Each	Is
Altogether	Difference	Every	Equal	Are
Both	Fewer	At this rate	Equally	Was
In All	How many/much more?	Of	Per	Were
Sum	Left	Product	Separate	Will be
Total	Less	Multiplied	Quotient	Gives
Together	Minus	Doubled, tripled, etc.		Yields
Increased by	Needs to			Equals
	Remains			
	Subtract			

2. Look for Groups of Similar Items
        Help keep your numbers organized!

3. Use the CUBE Method

    C – (Circle) the numbers

    U –   Underline important words

    B – | Box | the questions

    E –   ~~Eliminate~~ unnecessary information

4. Break Up the Problem
        Make a hard problem easier by breaking it up into smaller problems!

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PART 4. IN CLASS EXAMPLES Page 1 of 2

Find the telling words and solve the problems.

1) Betsy the great white shark swam 30 miles on Tuesday, 41 miles on Wednesday, and 49 miles on Thursday. How many miles did she swim altogether?

2) Pablo is a 5 ft long immature (meaning not yet full grown) mako shark. If he doubles in length by the time he matures, how long would he be?

3) Great white sharks can have 6 to 10 pups per litter. If Albertina has given birth 3 times and had a total of 21 pups, how many pups would she average per litter?

Look for groups of similar items to solve the problems.

1) Over the course of one month, white shark Philip ate 3 sea lions, 1 seal, 6 tunas, and 3 mackerels. Another great white, Mary Lee, ate 4 sea lions, 2 seals, 2 tunas, and 1 mackerel.
   a. How many marine creatures did Mary Lee eat during the month?

   b. How many seals were eaten by the two sharks during the month?

2) The OCERACH Global Shark Tracker™ shows 11 sharks that were tagged in US waters. During the OCEARCH team's expeditions to Cape Cod, Massachusetts, 2 great whites were tagged in 2012, and another 2 were tagged in 2013. Also in 2013, 3 bull sharks were tagged in Boca Grande, Florida, and 2 blue sharks and 2 mako sharks were tagged in Montauk, New York. Of the 11 sharks tagged in US waters, how many sharks were tagged in 2013?

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PART 4. IN CLASS EXAMPLES **Page 2 of 2**

<u>Use the CUBE method to solve the problems.</u>

1) Ms. Miller's 4th grade class is learning all about sharks through OCEARCH. 5 students are studying about shark physiology, 6 students are studying shark habitats, 3 students are studying sharks in the food web, 7 students are studying shark conservation, 4 students are studying sharks in mythology, and 3 students are studying shark migrations. How many students are in Ms. Miller's class?

2) The OCEARCH marine vessel was in the Gulf of Panama on January 1. It needed to reach Baltra Island in Galapagos, 950 miles away, 5 days later, on January 6. How many miles per day did the vessel need to travel in order to reach its destination on time?

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SOLVING WORD PROBLEMS
/ ACTIVITY 1. FORAGING GAME

INTRODUCTION

Sharks are predators and have to forage for prey. Some sharks, like the zebra shark, have whisker like barbels near their nostrils to help them find crustaceans hidden in the sand while others like great whites travel long distances to find and capture large prey. This game allows students to practice their math skills while also introducing them to the concept of foraging. An optional student handout is provided with instructions for this activity.

MATERIALS

- 24 fish pictures (included below)
- 3 envelopes
- 16 snail pictures (included below)
- 40 Krill Pictures (included below)

INSTRUCTIONS

- Cut fish, krill, and snail cards out, and place each kind in a separate envelope.
- Designate three students to make up the <u>feeder group</u>. Divide the rest of the class into 3 equal groups. The three large groups are the <u>whale sharks</u>, <u>white sharks</u>, and <u>zebra sharks</u>.
- Have the feeder groups sit at their desk with their heads down. while the feeder group meets with the teacher.
- Hand each student in the feeder group one of the envelopes containing the prey cards. Give them one minute to place all of the cards in their envelope around the classroom. The cards should not be hidden anywhere too difficult or easy for the other students to find.
- Let the predator groups know when they can look up. Explain that the whale sharks are predators of KRILL and they must find the krill cards; the white sharks are predators of FISH and they must find the fish cards; the zebra sharks are predators of SNAILS and must find the snail cards.
- Once the students understand, the shark groups have one minute to find as many of the appropriate prey cards as possible. Of course, safety comes first and there is no pushing, running, climbing, or fighting over cards allowed (if there is a conflict over a card, rock-paper-scissors for it). After one minute, students return to their seats.
- As a class, answer the following questions:
  1. How many fish, krill, and snails were there to start? (Feeder Group can answer this question)
  2. How many cards did each predator "eat" (or each student find)?
  3. How many fish did all the White Sharks eat? How many fish are left?
  4. How many krill did all the Whale Sharks eat? How many krill are left?
  5. How many snails did all the Zebra Sharks eat? How many snails are left?
  6. Which student found the most cards? What is the difference in cards between the person who found the most cards, and the person/people who found the fewest?
  7. Which shark group found the most cards? If every student in the white shark group found the same amount of cards, how many would each student have? How many krill cards would each Whale Shark student get? How many snail cards would each Zebra Shark student receive?
- Repeat the foraging part of the game several times, adjusting the hide and seek times (30 seconds – 3 minutes) and letting students alternate between prey and predator.
- At the end, answer the final question, How many seeking minutes did it take for the most cards per group to be found? In how many seconds/minutes were the fewest cards per group found?

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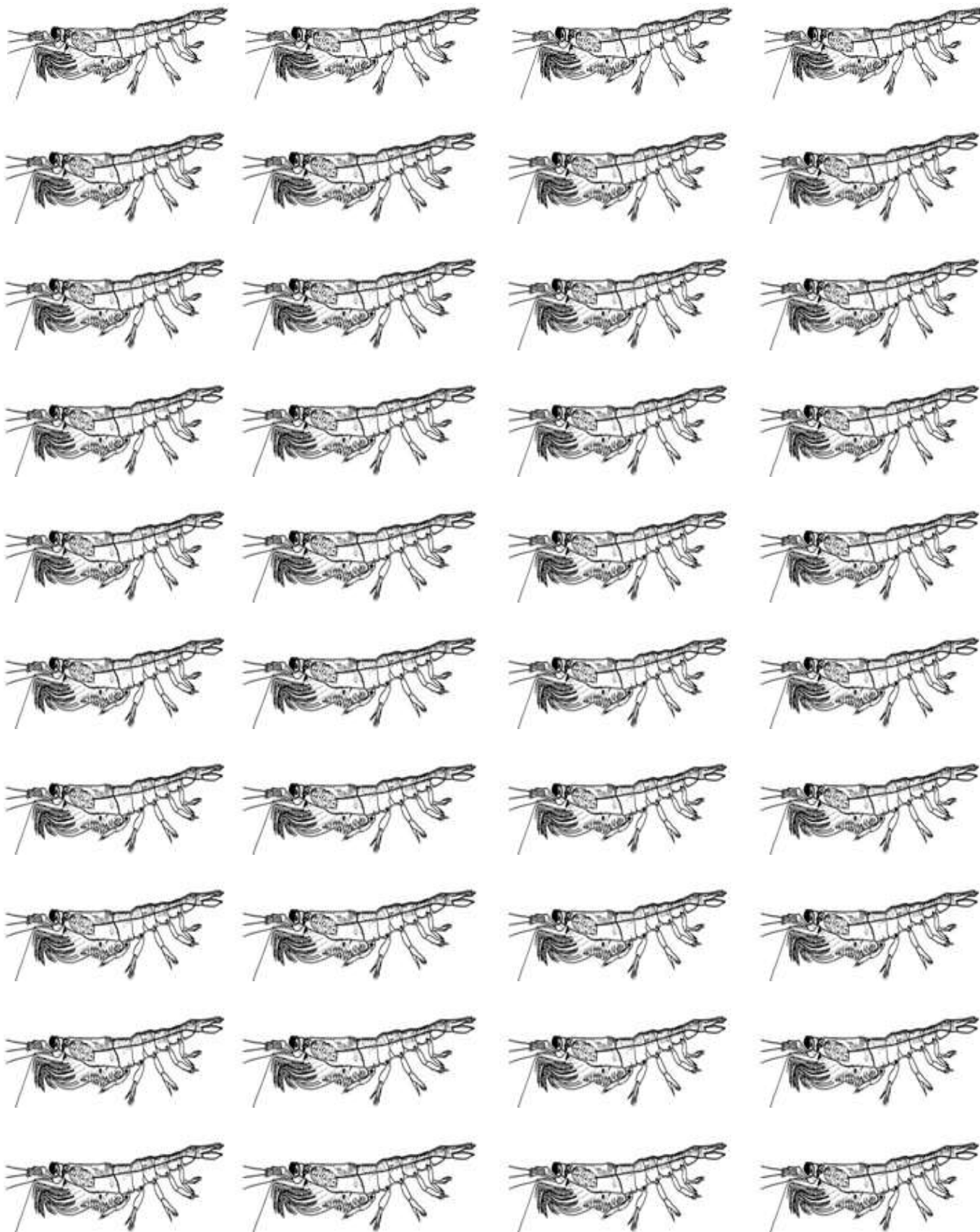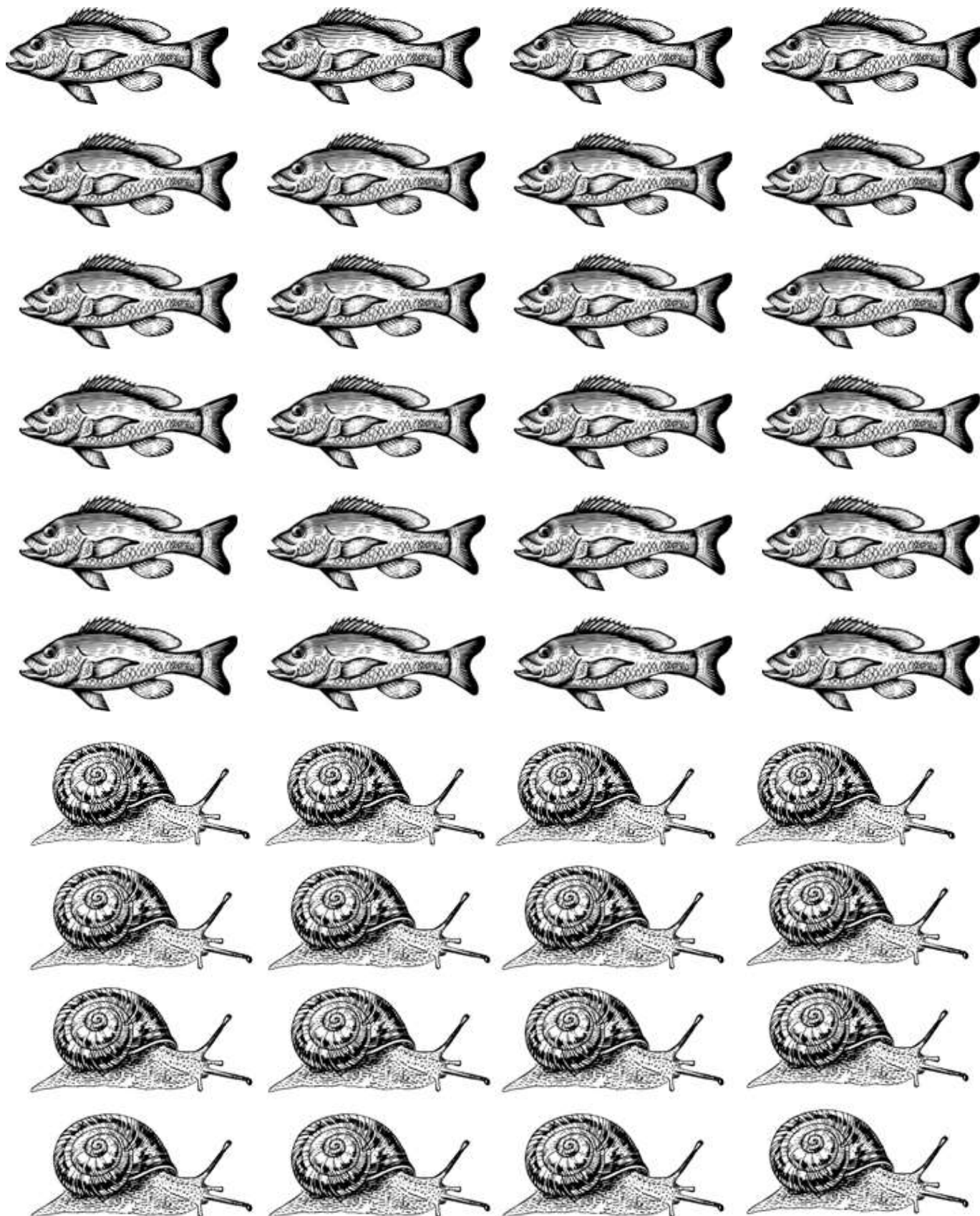
Name: _____

Date: _____

ACTIVITY 1. FORAGING GAME

1. How many prey animals were there starting out?

   _____ fish   _____ krill   _____ snails

2. How many prey animals did each predator eat? Help your teacher make a chart!

3. How many fish did the white sharks eat?   _____

   How many fish are left?   _____

4. How many krill did the whale sharks eat?   _____

   How many krill are left?   _____

5. How many snails did the zebra sharks eat?   _____

   How many snails are left?   _____

6. Which student found the most cards? _____

   What is the difference between the students who found the most and least cards?

   _____

7. If every student in the white shark group found the same amount of fish, how   many would each student have?

   _____

   How many krill would each student in the white shark group get?

   _____

   How many snails would each student in the zebra shark group get?

   _____

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SOLVING WORD PROBLEMS
/ ACTIVITY 2. CREATING WORD PROBLEMS

INTRODUCTION

When we read and solve a word problem, we do not usually stop and think about where the information came from. Scientists on the OCEARCH team collect large amounts of data and often need to use the information they have to discover answers to problems they encounter. This activity will allow students to use the OCEARCH website to collect information and then create and solve their own word problems. Students may work alone or in groups.

MATERIALS

- Computer with internet access
- Paper and Pencil

INSTRUCTIONS

Give students time to explore and familiarize themselves with the OCEARCH website (www.ocearch.org). They can use any information they find to create their word problems as long as they include the necessary numbers to answer their question.

Tips:
- Possible questions could relate to shark weight, length, species, etc.
- Students can always use examples from class as a template.
- Some numbers they find may be decimals. If you have not covered decimals in class students can round to the nearest whole number.

After writing their problem, students will need to solve and show their work. If you choose to have students trade problems for added practice, solutions can be written on the back or on an additional piece of paper.

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