

Dolphin Division

Grade Level: Grade 3

Mathematics Skills: Multiplication, Division, & Fractions

Florida Sunshine State Standards: MA.3.A.1.1, MA.3.A.1.2, MA.3.A.2.3

Description:

Students will apply division and fractions to real-world applications in an aquarium setting by learning how food is divided among animals and how time is divided during animal training sessions.

Materials:

- “Why Train a Dolphin?” story
- “CMA Dolphin Presentation” video (available online)/video player
- Dolphin behavior cutouts
- Tape or magnets
- Chart paper or white board
- “Training To-Do” worksheet
- “Dolphin Division” worksheet

Preparations:

Print and cut out the dolphin behavior cards and attach either tape (if using chart paper) or magnets (if using the white board) on the back side. Make the appropriate number of copies of both the “Training To-Do” handout and the “Dolphin Division” handout.

Procedures:

- 1) Ask the class about the dolphins they have seen at zoos or aquariums. Discuss some of the different tricks or behaviors that the dolphins perform during shows and have students offer suggestions as to why these behaviors are taught to the animals.
- 2) Watch the “Dolphin Show” video (found online) with the class and have them write down their favorite things that the dolphins did during the presentation.
- 3) Read “Why Train a Dolphin?” aloud to the class. After the reading, have students raise their hands and explain why the dolphins may have done their favorite things from the video.

- 4) Create a chart like the one in figure 1 below.

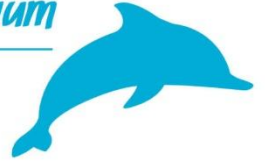
Figure 1:

High Energy/ Exercise	Husbandry/ Medical	Cognitive/ Learning

- 5) Have the students classify the different behaviors (from the “Dolphin Behavior” cutouts) into the appropriate category.
- 6) Use common fractions to divide up the behaviors into a training session as a class. For example, if $\frac{3}{5}$ of the behaviors are exercise, then $\frac{1}{5}$ can be medical and $\frac{1}{5}$ can be learning. Another example would be to divide the training session up evenly. Just remember that each training session has to have all three types of behaviors. Have the students work through a few examples.
- 7) Explain to students that dolphins get fed bigger fish for harder behaviors and smaller fish for easier behaviors. Place a herring (big fish) magnet next to all the designated harder behaviors and a small fish magnet (capelin) next to all the designated easier behaviors.
- 8) Now, provide the students with a set number of herring and capelin (5 and 10, respectively, for example). Have the class divide up a training session using the amount of fish they use as a guide.
- 9) Divide the students into groups and pass out the “Training To-Do” worksheet.
- 10) Have each group present their dolphin presentation.

Homework:

- “Dolphin Division” worksheet



Why Train a Dolphin?

Winter

The Clearwater Marine Aquarium is not your typical aquarium. It is actually a marine animal hospital. All the animals that live at the aquarium were rescued from the wild because they were very sick or were injured in some way. The reasons they arrived at CMA are all different, but once they are there, they receive the best care.

One of the types of animals that live at the Clearwater Marine Aquarium is the Atlantic Bottlenose Dolphin. The dolphin trainers at CMA work very hard to care for our rescued dolphins. They are in charge of teaching the dolphins to perform behaviors on cue, feeding the dolphins as a reward for correct behavior, and making sure the dolphins are healthy. There is a lot of hard work that goes on behind-the-scenes, including dividing up the dolphin's daily food, cleaning and scrubbing the dolphin's tanks, and working long hours to feed the dolphins on time. The most exciting parts of the day are the training sessions that occur during the dolphin shows. Although these shows are very fun for the dolphins, their trainers, and all the guests watching, they serve a very important purpose.

Dolphins have lots of energy and need tons of exercise. In the wild, dolphins would get their exercise by hunting or avoiding predators. At the Clearwater Marine Aquarium, the dolphins perform "high energy behaviors", like jumps, flips, and tail slaps to get their exercise. All of these behaviors mimic ones that dolphins do in the wild, either to hunt or play.

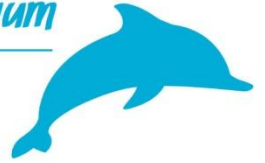
Dolphins are also very intelligent. Just like we do puzzles, play games, or go to school to learn more about the world around us, the dolphins that live at the Clearwater Marine Aquarium like to do activities that require a lot of thinking. They call these "cognitive behaviors." Sometimes the trainers will have the dolphins match one toy with another based on its shape or size. Other times, they will work on training a new behavior to the dolphin, just like we might learn a new way to do a math problem or a new vocabulary word in school.

The most important reason that the dolphins at the Clearwater Marine Aquarium are trained is to help take care of them. Sometimes, going to the doctor can make people nervous, even if it's just for a check-up. Dolphins will get nervous just like we do, so the trainers at the Clearwater Marine Aquarium help to keep the dolphins calm by rehearsing the different behaviors they would do during a check-up with the veterinarian. These behaviors are called "husbandry behaviors." The dolphins

practice presenting their tail flukes to the trainers, just like they would have to if they were getting a shot. They also practice holding still while the trainers look in their mouths to check their teeth, just like a dentist visit. One of the most exciting behaviors that the dolphins practice is when they beach themselves, or come all the way out of the water onto a platform. This is a good time for the trainers or the vet to look at the dolphin's whole body and make sure they are healthy.

Winter the dolphin is a very special animal that has spent a lot of time learning behaviors that help the staff at Clearwater Marine Aquarium take care of her. When Winter was between two and three months old, she got tangled in the ropes of a crab trap line. She lost her tail and had to learn to swim a whole new way, moving side to side like a fish instead of up and down like a dolphin. The veterinarian and her trainers became worried that Winter would hurt her back by swimming so differently so they worked with Hanger Prosthetics to create an artificial tail. Winter has been trained to present her tail stub to the veterinarian for measurements, to move her artificial tail up and down, and even jump out of the water.

In order to make the most of each training session, the dolphin trainers must plan how they want to divide their time and their food with Winter and the other dolphins. They have to make sure that the dolphins have time to learn, time to play and exercise, and time to practice behaviors they would use during a check-up. They also have to divide up the dolphin's daily diet so that there is enough food for each training session. Today, we are going to learn how to plan out a dolphin training session using fractions as a guide.



Trainer To Do

Name: _____

Directions: Congratulations! Today is your first day as a dolphin trainer at the Clearwater Marine Aquarium. This is an exciting job, but it requires a lot of hard work! Before you work with the dolphins in a training session, there are few things you have to plan out.

Dolphin Behaviors:

Many people use the term “trick” to describe the different activities that dolphins perform during a show or training session. Dolphin trainers will call those activities “behaviors” because they serve a more important purpose than just entertainment, such as exercise, learning, or medical training for the animal. Look at the chart below for an example of some of CMA’s dolphins’ behaviors.

	Hope		NICHOLAS		Panama		Winter	
	<i>Harder</i>	<i>Easier</i>	<i>Harder</i>	<i>Easier</i>	<i>Harder</i>	<i>Easier</i>	<i>Harder</i>	<i>Easier</i>
High Energy <i>These behaviors are great exercise for our dolphins!</i>	Somersault Forward Tail Walk	Pectoral Splash Bow	Somersault Breach	Forward Tail Walk Bow Beach	Beach Bow	Pectoral Splash Forward Tail Walk	Bow Beach	Pectoral Splash Somersault
Cognitive <i>These behaviors make our dolphins think about problem solving or learn new things. They are fun, like doing a puzzle!</i>	<i>Harder</i> Painting Retrieval	<i>Easier</i> Mimicry Hand Target	<i>Harder</i> Foot Push Painting Pectoral Shake	<i>Easier</i> Hand Target Hug Retrieval Mimicry	<i>Harder</i> Foot Push Painting Pectoral Shake	<i>Easier</i> Hand Target Hug Retrieval	<i>Harder</i> Hug Painting Pectoral Shake	<i>Easier</i> Hand Target Pectoral Splash Retrieval
HUSBANDRY <i>These behaviors are important because they help the trainers take good care of the dolphins and make sure they are healthy.</i>	<i>Harder</i> Blood Draw Stretcher Mouth Open	<i>Easier</i> Pectoral Hold Dorsal Layout	<i>Harder</i> Beach with Stretcher Blood Draw Stretcher	<i>Easier</i> Mouth Open Dorsal Layout Pectoral Hold	<i>Harder</i> Stretcher Blood Draw	<i>Easier</i> Mouth Open Pectoral Hold Dorsal Layout	<i>Harder</i> Stretcher Physical Therapy	<i>Easier</i> Dorsal Layout Pectoral Hold Mouth Open

Part One Directions: The fractions below represent the amount of the training session spent on each type of behavior Use the given fractions to solve how many of each type of behavior the dolphins will do in a training session.

- 1) $\frac{1}{2}$ High Energy, $\frac{1}{4}$ Cognitive, and $\frac{1}{4}$ Husbandry – 12 behaviors total
- 2) $\frac{3}{4}$ Cognitive, $\frac{1}{8}$ High Energy, $\frac{1}{8}$ Husbandry – 16 behaviors total
- 3) $\frac{4}{10}$ Husbandry, $\frac{2}{10}$ Cognitive, $\frac{2}{5}$ High Energy – 5 behaviors total
- 4) $\frac{1}{3}$ High Energy, $\frac{1}{6}$ Cognitive, $\frac{1}{6}$ Husbandry – 18 behaviors total

Part Two Directions: Create your own presentation by following the given steps.

1) Pick your dolphin:

All dolphins learn differently, so each of our dolphins knows a different set of behaviors. Take a look at the dolphins below and circle the name of the dolphin you would like to star in your training session.

Hope

Nicholas

Panama

Winter

10 pounds of food

16 pounds of food

16 pounds of food

12 pounds of food

2) Food Prep

The amount of food that the dolphin eats determines how many fish you will have to reward them after a behavior. Every pound of food has $\frac{1}{2}$ herring and 1 capelin. Dolphins eat 1 herring for every harder behavior they perform and 1 capelin for every easier behavior they perform. How many herring and capelin will you have for the training session with your chosen dolphin?

_____ Herring

_____ Capelin

3) Plan your training session

Use the chart on the first page to find the behaviors your dolphin can perform. You can repeat behaviors if you'd like, just remember to use one behavior (difficult or easy) from each category (high energy, cognitive, and husbandry) during your training session. Use the "Plan Your Training Session" chart to write in the order of your behaviors. Let the training begin!

Plan Your Training Session

Dolphin Name: _____

Herring: _____ Capelin: _____

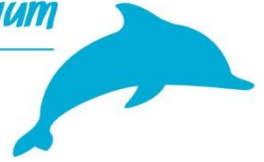
Behavior	Category	Number of times	Herring	Capelin

What was the total number of behaviors in your training session? _____

What fraction of your training session was spent on high energy behaviors? _____

What fraction of your training session was spent on cognitive behaviors? _____

What fraction of your training session was spent on husbandry behaviors? _____



Dolphin Division



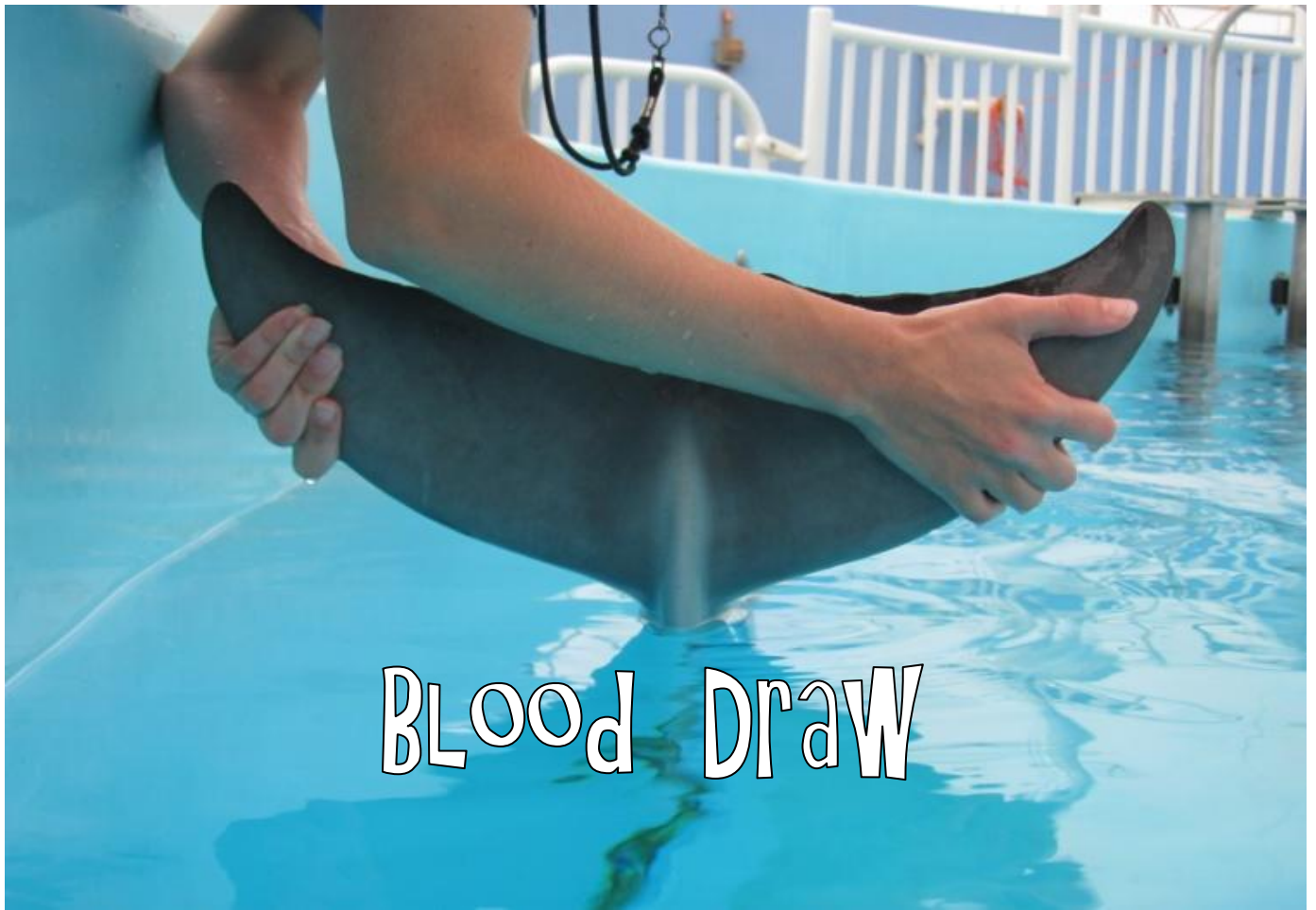
Directions: Answer the following questions using your knowledge of multiplication, division, and fractions. Be sure to simplify your fractions!

- 1) Winter eats 12 pounds of fish per day. The trainers want to divide that food so that Winter has an equal amount for each of her training sessions. She has 4 sessions per day. How many pound of food will Winter receive at each training session?
- 2) Write a fraction for the amount of fish Winter receives in each training session. Make sure it is the simplest fraction!
- 3) Nicholas the dolphin eats 18 pounds of fish per day. The trainers want to feed Nicholas 6 pounds of food per training session. How many training sessions can Nicholas participate in?
- 4) Write a fraction for the amount of fish Nicholas receives in each training session. Make sure it is the simplest fraction!
- 5) Hope the dolphin participates in 3 training sessions every day. At each session, she eats 4 pounds of fish. How many pounds of fish does Hope eat every day?

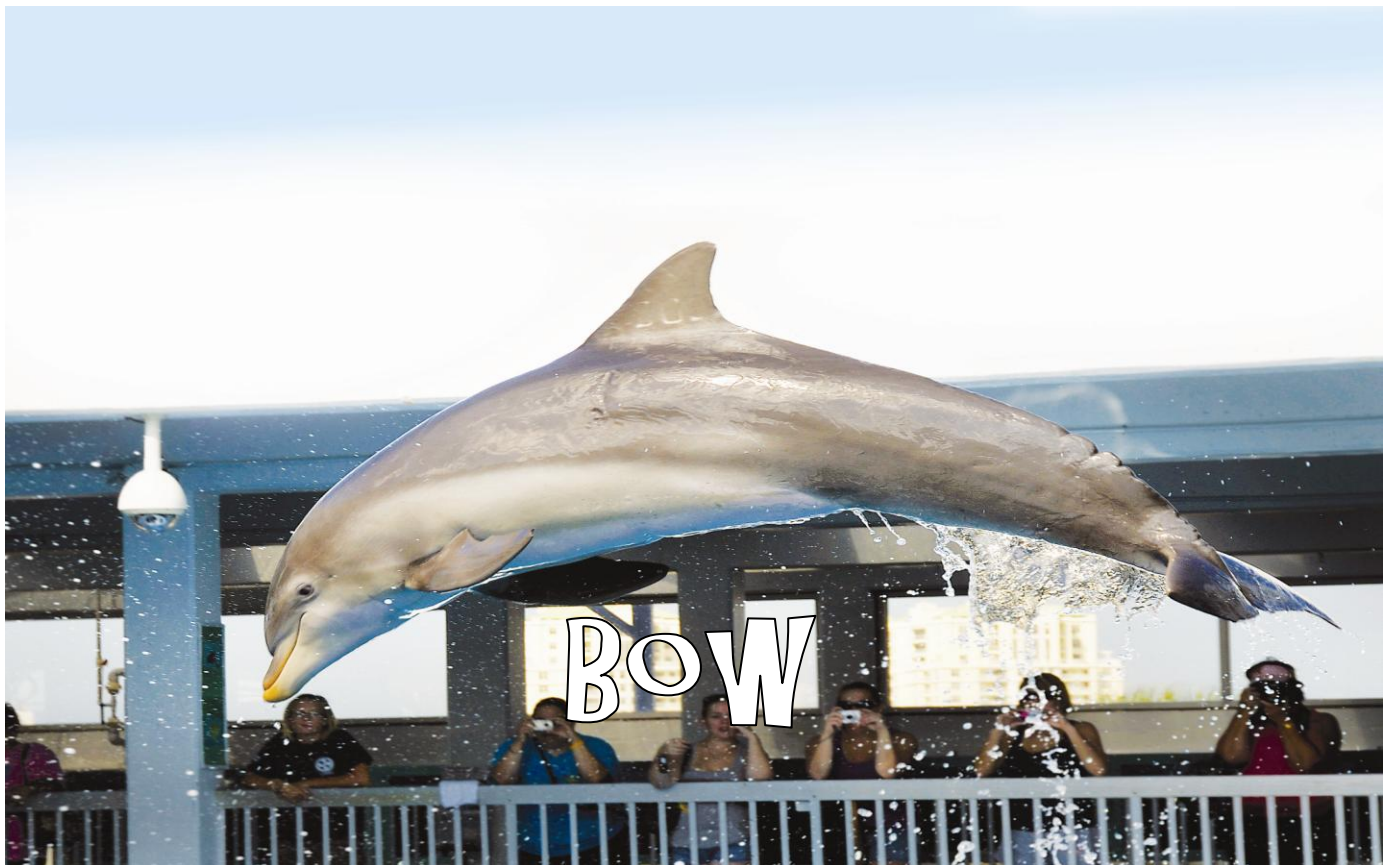
- 6) Write a fraction for the amount of fish Hope receives in each training session. Make sure it is the simplest fraction.
- 7) Look at the fractions you wrote down in Answers 4 and 6. Which dolphin eats more fish per training session: Nicholas or Hope?
- 8) Panama eats 6 pounds of herring (a large fish) and 9 pounds of capelin (a small fish) every day. Represent both these amounts as fractions of Panama's daily diet.
- 9) During a dolphin presentation, Panama does 4 jumps (called bows), 6 tail slaps, and squirts water at her trainer 2 times. Winter swims in circles 3 times and waves to the crowd 1 time. Write the total number of behaviors performed. What is the fraction of behaviors the Panama performed? What is the fraction of behaviors that Winter performed?
- 10) Within a 20 minute session, the trainers work on 8 minutes of high energy jumps, 2 minutes of presenting their tails for medical training, 5 minutes of a matching game, and the remaining time training a new behavior. Write simplified fractions for each activity. What fraction of time was spent training the new behavior?



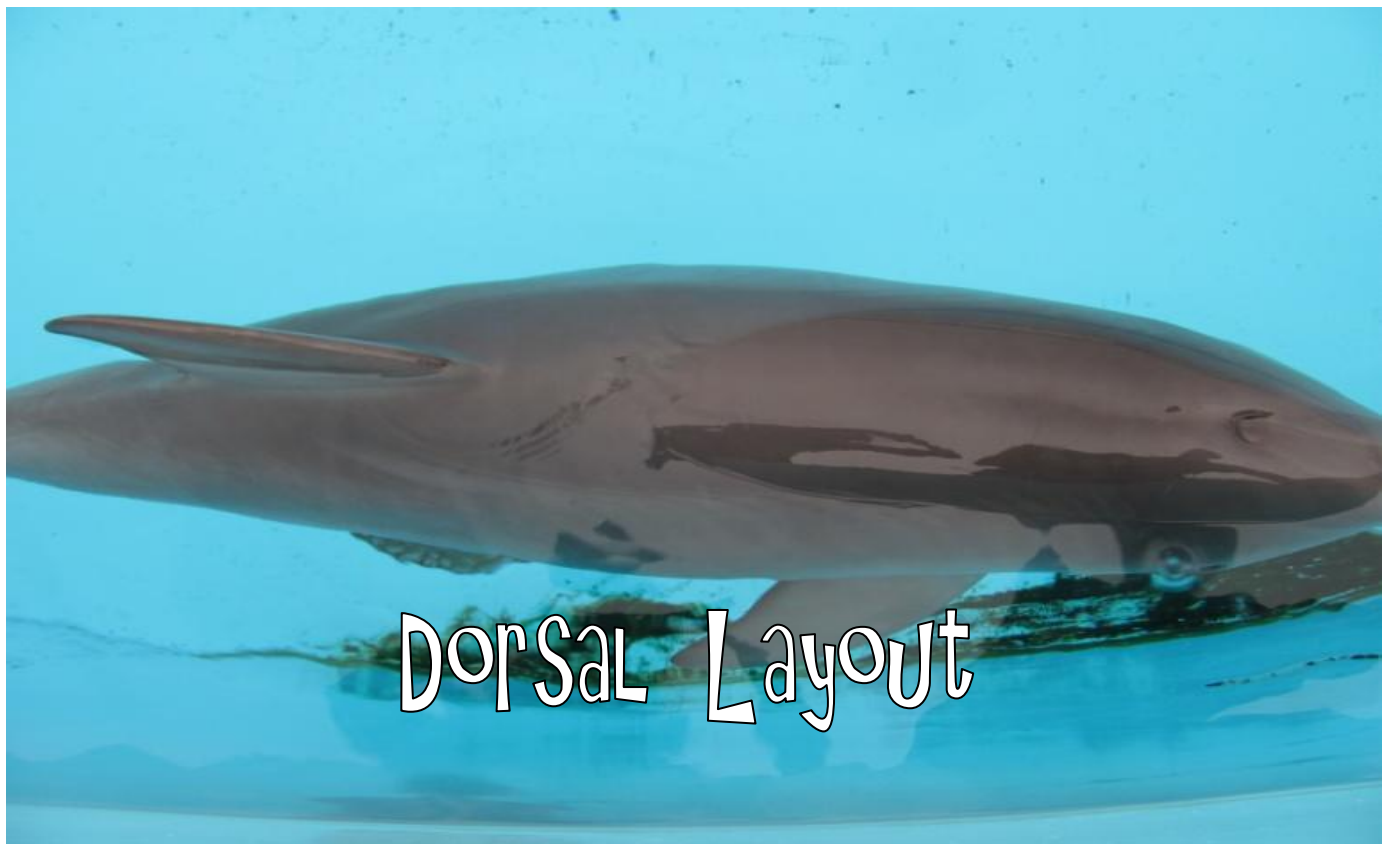




Blood Draw



Bow





Foot PUSH



Forward Tail Walk



Hug



Hand Target

Mimicry



Mouth Open







PHySical THerapy



Retrieval



