

DOLPHIN RESEARCH CENTER

Problem Solving at DRC!

Grade Level: 5th

Objective: Students will understand the different ways numbers are represented and used in the real world and the effects of operations on numbers, and the relationship among these operations, select appropriate operations, and to compute for problem solving. Students will select the appropriate operation to solve specific problems involving addition, subtraction, and multiplication of whole numbers.

Florida Sunshine State Standards:

Mathematics

MA.A.1.2.3: The student understands concrete representations of whole numbers in real-world situations.

MA.A.3.2.2: The student selects the appropriate operation to solve specific problems involving addition, subtraction, and/or multiplication of whole numbers, decimals, and fractions.

National Science Education Standards:

Content Standard A (5th) - Understandings about Scientific Inquiry: Mathematics is important in all aspects of scientific inquiry.

Background: This hand out can be incorporated into a mathematics unit involving word problems and the following operations: addition, subtraction, calculating average, multiplication, division, and also basic units of measurement. The word problems focus on Dolphin Research Center, so here is a little about our history: Dolphin Research Center and its precursors have operated continuously at the same site on Grassy Key since 1958. *Milton Santini*, an early pioneer in dolphin collection, husbandry, and training founded it as **Santini's Porpoise School**. One of Santini's dolphins, *Mitzi*, starred in the original *Flipper* movie and her final resting place and monument can be seen here on the property. The story of *Flipper* was actually based on Santini's close relationship with *Mitzi*. The progeny of Santini's original colony have produced a third generation of Grassy Key dolphins.

When *Mitzi* passed away in 1972, Santini sold out to an entertainment conglomerate, which operated the facility until 1977 as a dolphin show known as **Flipper's Sea School**. *Flipper's* was purchased in 1977 by *Jean Paul Fortom-Gouin*, a well-recognized whale conservation activist who closed *Flipper's* to the public and concentrated on various types of research. His goal was to prove that dolphins were highly intelligent, an argument to convince the world to stop hunting whales. Renamed the **Institute for Delphinid Research**, the facility conducted research on dolphins' language and reasoning abilities, and learned that dolphins are capable of understanding simple vocabulary and syntax, the essence of language.



In 1983, the International Whaling Commission adopted a voluntary whaling moratorium. Jean Paul's primary goal was achieved, so his funding sources ran out, and he no longer could support the research facility. He gave a "one time" offer of the business and the dolphins (along with all the debts!) to his then general manager and head trainer, *Jayne and Mandy Rodriguez*. Jayne and Mandy accepted the offer to run the business on their own. In 1984 they formed the not-for-profit **Dolphin Research Center** and set as its goals the establishment of a unique educational and research facility.

The Dolphin Research Center family was built as a promise to the dolphins that live here to always provide them with a secure and loving home. The financial burdens were challenging to say the least, especially when it became necessary to actually purchase the land in 1990. Against all odds, we mustered the funds for a down payment and bought the land. In the spring of 1994, due to the contributions of many supporters, the original mortgage was paid off and the dolphins assured of a secure home. Early in 1995, we purchased additional bordering property to enable continued expansion.

The properties on Grassy Key that make up Dolphin Research Center consist of about four acres of land and water with frontage on both US. 1 and the Gulf of Mexico. Our dolphin and sea lion family lives in ninety thousand square feet of seawater lagoons with low fences separating them from the open waters of the Gulf of Mexico. These pools were blasted out of the coral rock bottom by Mr. Santini in the 1950s and range from four to thirty feet in depth, with an average depth of fifteen feet. Natural tidal flow flushes them daily. These pools represent an irreplaceable asset, as the alteration of the coastline is severely restricted today by environmental concerns. The fences surrounding the pools protect the dolphins from large predators and the curious public, while admitting a variety of local marine life. A causeway wide enough to accommodate a truck bisects the dolphin area, and two wooden boardwalks allow access to feeding docks in the various lagoons. This physical arrangement offers remarkable flexibility. The dry land portion of the properties contains seventeen structures which provide offices for: corporate, animal care, guest programs, guest services, dolphin/child, education, environmental services, media relations, medical, research, special projects, and volunteer departments. They also provide space for the environmental shop, food preparation, classrooms, storage areas, and residencies for *DolphinLab* and the lead caretaker.

Dolphin Research Center is a not-for-profit, publicly funded center. The bottlenose dolphins and California sea lions presently living at DRC provide a range of personalities and backgrounds. Some were born here; others came to DRC from separate facilities for various reasons. The public is invited to meet them all and learn each one's story.

Materials:

- Copies of the hand out
- Pencils



Procedure:

1. Select information about the history of DRC that you would like to share with the class.
2. Pass out handouts and either do as a class, individually, or in groups.

Wrap up: Go over answers together. Students can switch papers if they don't prefer to check their own work.

Taking it further:

- Have students come up with their own word problems about DRC and share them!





1. The Dolphin Research Center was founded in 1984. Using today's date how many days has the center been in existence?
2. The Dolphin Research Center consists of 4 acres of land. If there are 43,560 square feet in an acre, how many square feet are there at the DRC?
3. The dolphin pools at Dolphin Research Center are of varied depths. If there are nine pools with depths of 3.5, 15.5, 13, 8.5, 17, 11.5, 14.5, 15, and 20 feet. What is the average depth of the pools?
4. Delphi, a male dolphin at DRC, is the father of Aleta, Merina, Santini and Talon. Santini was born after Merina but before Talon. Talon was born after Aleta. Aleta was born before Santini. Write the order from oldest to youngest.
5. Tursi, a female dolphin at DRC, was born in 1973, Sandy was born in 1979, and Pandora was born in 1997. How much older is Tursi than Pandora? How much younger is Pandora to Sandy?



6. The Dolphin Research Center is a very busy place. We recorded how many visitors came each day:

Monday.....	250 visitors
Tuesday.....	280 visitors
Wednesday.....	189 visitors
Thursday.....	208 visitors
Friday.....	212 visitors
Saturday.....	197 visitors
Sunday.....	176 visitors

What is the total number of visitors?

What is the average number of visitors for the week?

7. Dolphins are sometimes found swimming along the coastline. If a dolphin swims 7 miles per hour for nine hours, how many miles did the dolphin swim?

8. If for the next 6 hours a dolphin swam at a speed of 5 miles per hour, how many miles did it swim?

9. For the next five hours the dolphin's speed slowed to 3 miles an hour. How many miles did the dolphin swim?

10. How many miles did the dolphin swim in total?

