**Before Investigation 1**

**Pre-Test:**

* [Investigation 1 Pre-Test](file:///C:\Users\Karen\Desktop\Teaching%20Strategies\Math\Investigations\5th%20Grade\Investigation%201\Investigation%201%20Pre%20Test.docx) for each student

**Investigation 1.1 ~ Things That Come in Arrays**

**Copies to Make:**

* Student activity book page 1-3
* Design and array backed with M2 graph paper

**Materials to Gather:**

* None

**Vocabulary**

* Array
* Dimensions
* Multiplication

**Lesson 1.1: Things that Come in Arrays**

**Introduction**

* Introduce math procedures to students.
* Warm up- have students think of some ways they can make the number 425 (ex: 400 + 20+ 5 or 500- 75). Let them explore.
* Discuss
* This unit focuses on multiplication.

**Discussion**

* An array is a group of objects that are in equal rows. Have pairs of students do student activity book page 1.
* Discuss the different strategies to solve how many orange juice cans there are.

**Activity**

* Have the students look around the room to find other things in arrays. Record them on student activity page 2.
* Discuss what students found.
* Can you use multiplication to describe the array?
* Multiplication is about groups of numbers. How many groups are there?
* How many in each group?

**Activity**

* Have students build their own arrays using blocks.
* Have them pass their array to another student to record how many rows, how many in each row, the multiplication problem, and the total.
* Have students pass their work to another student to check.
* Share and discuss.
* Repeat

**Independent Work**

* Student Activity Book page 3

**Review**

* Review vocab cards from “independent reading and writing center”
* What did you learn today?

**Investigation 1.2 ~ Making Arrays**

**Copies to Make:**

* Eggland backed with M2
* Making Arrays backed with M2 plus extra
* Student Activity Book, page 7

**Materials to Gather:**

* Empty Egg Carton

**Vocabulary**

* No new vocabulary

**Lesson 1.2: Making Arrays**

**Introduction**

* Remind students of math procedures.
* What did we learn yesterday?
* Warm up- have students think of some ways they can make the number 219 (ex: 200 + 10+ 9 or 500- 300 + 19). Let them explore.
* Discuss

**Activity**

* Yesterday we learned a lot about arrays. What is an array?
* Today I have an exciting challenge to you. Read “Eggland” sheet with the CEO’s challenge.
* Give students time to work to complete the challenge
* Discuss students’ ideas
* Discuss that the dimensions of the boxes they made are factors of 12.

**Making Arrays**

* Hand out “Making Arrays” sheet and M2 paper.
* Assign students two numbers to work with. For each number they need to design all the arrays they can think of with blocks, draw the array on graph paper, and label it with the dimensions. Have the put them in a safe spot because you will use them tomorrow.
* What are the smallest and largest factors for your number?
* Were there numbers you knew would not work?

**Independent Work**

* Student Activity Book page 7

**Review**

* Review vocab cards from “independent reading and writing center”
* What did you learn today?

**Investigation 1.3 Making Arrays, Part 2**

**Copies to Make:**

* Looking at Arrays
* Sorting Arrays
* Student Activity book page 8

**Materials to Gather:**

* Large pieces of construction paper.
* Glue
* Scissors
* Paper Plates
* Numbers (that were used for arrays) written on paper and cut apart. One set for each team of two students.
* Have student get out markers to make their arrays or provide markers.
* You could also use blocks if you would rather have students build arrays rather than draw them.

**Vocabulary**

* Square
* Composite
* Prime

**Lesson 1.3: Making Arrays, part 2**

**Introduction**

* Remind students of math procedures.
* What did we learn yesterday?
* Warm up- have students think of some ways they can make the number 562 (ex: 500 + 60+ 2 or 700- 100 – 30- 8). Let them explore.
* Discuss

**Activity**

* Yesterday we found a lot of ways to make lots of arrays with one number.
* Today we want to share what we learned. Have students label sheet of paper with “ways to make \_\_” and have the paste their arrays onto the sheet.
* Have students share their findings with the class. Classmates not presenting may take notes on their peer’s findings.

**Activity**

* What numbers only had one possible array?
* What numbers had a square array?
* Which numbers had many arrays?
* Have students sort the arrays into piles on the paper plates and fill out the sheet “sorting arrays”
* Discuss prime numbers, square numbers, and composite numbers.

**Independent Work**

* Student Activity Book page 8

**Review**

* Review vocab cards from “independent reading and writing center”
* What did you learn today?

**Investigation 1.4 ~ Which Combinations Do I Know?**

**Copies to Make:**

* Array Cards (M9-M29)
* Student Activity Book, page 9
* Which Combinations Do I Know

**Materials to Gather:**

* Array Cards Cut Apart and put into envelopes (1 set per child)
* Paper Plates

**Vocabulary**

* No new vocabulary

**Lesson 1.4. Which Combinations Do I Know?**

**Introduction**

* Review Prime numbers, composite numbers, and square numbers.
* Warm up- have students think of some ways they can make the number 471 (ex: 400 + 70+ 1 or 500- 30 + 1). Let them explore.
* Discuss

**Array Card Sort**

* Tell students you are giving them some pictures of arrays. Their job is to put them into 2 piles- ones the know the answer to without counting and ones they need to practice. I usually use labeled paper plates to help structure the sort.
* Students record the ones they know and the ones they need to work on.
* Discuss ones that are easy for students.
* Discuss ones that are difficult for students.
* Discuss strategies for solving difficult combinations.

**Game**

* We’re going to play factor pairs!
* This is to practice speedy multiplication. It’s more about learning than about winning.
* Have students pair up and lay out all the factors. Students will take turns pointing to an array, saying the total, and flipping it over to check if they are right. Whoever has the most cards at the end wins.

**Independent Work**

* Student Activity Book, page 9, 11-12

**Review**

* Review vocab cards from “independent reading and writing center”
* What did you learn today?

**Investigation 1.5 ~ Test Review**

**Copies to Make:**

* Practice Test
* Investigation 1 Test

**Materials to Gather:**

* None

**Vocabulary**

* No new vocabulary

**Lesson 1.5. Test Review**

**Review Vocabulary:** word ring

**Review Today’s Number:** Find many ways to make 891