

Algebra/Geometry Institute Summer 2002



Lesson Planning Guide

Faculty Name: Sharon Fraiser

School: East Elementary Greenwood, Ms

Grade Level: Sixth

1 Teaching objective(s)
Distinguish between prime and composite numbers.

2 Instructional Activities

The teacher will put the problem of the day on the board. (See word document)
The students will solve the problem and the teacher will call on a student to provide the correct answer. The teacher and the other students will check for accuracy. The teacher will “set” the lesson by asking students why they think we should learn about fractions and number theory. Examples should be: money-coins are fractions of a dollar; when cooking-cups and spoons are labeled with fractions; and in construction-materials have to be measured. Learning number theory will extend your understanding of the meaning of numbers. Today we are going to explore prime and composite numbers. This will be very important in our study of fractions and number theory. The teacher will then call on a student to review the class on the meanings of multiples, factors, prime, and composite numbers.

The teacher will then pass out a copy of the following problem:
A museum has 100 coins from ancient Greece. How many ways could the coins be displayed in equal rows? Have the students work together in groups to come up with the solution. Ask for a representative from one group to explain.
The teacher will then pass out an activity with 15 problems for the students to work. The teacher will work the first with the students and have them complete the others.
Next the teacher will explain about Eratosthenes, give each group a number chart from 1 to 100 and a list of steps to follow to decide whether 53 is a prime number. The teacher will go over this with the class when everyone has finished.
The last activity is a game called “Prime Time Take Away”. The teacher will give each two students a copy of the game and go over the instructions. The students will then play the game in pairs and keep their own scores.

1st Activity Worksheet

Prime and Composite Numbers

Name _____ Date _____

List all factor pairs for each number. Identify each number as prime or composite.

- | | | | | | |
|-------|-------|-------|--------|-------|--------|
| 1. 12 | 2. 21 | 3. 32 | 4. 50 | 5. 11 | 6. 36 |
| 7. 48 | 8. 51 | 9. 18 | 10. 30 | 11.31 | 12. 25 |

13. 86 14. 105 15. 17

Activity 2 “The Sieve of Eratosthenes”

1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100

Cross out 1, since 1 is not a prime.
Circle 2 because 2 is a prime. Cross out multiples of 2.
Go to the next number that is not crossed out. Circle it. Then cross out its multiples.
Repeat the steps until all the numbers are either circled or crossed out. The circled numbers are prime.
Write an ordered list of all of the prime numbers between 1 and 100.
Is 53 a prime number?

Activity 3 “Prime Take Away”

In this activity you will need to identify prime numbers. You will start with an imaginary 100 points and must then subtract prime numbers from your 100 points to arrive at zero. Each person gets a partner and two number cubes. Using the tape or stickers label one cube with the digits 0, 1, 2, 3, 4, and 5. The second cube should be labeled 4, 5, 6, 7, 8, and 9. Roll the cubes and use the two digits in either order or individually. For example, if a 2 and 3 are rolled you could make 23 or 32, or you might choose to use just the 2 or the 3.

You are allowed to subtract prime numbers only. If no prime number can be made from the roll, you lose your turn. If you try to subtract a number that is not prime, then 25 points are added to your score.

Keep track of your own scores. To win, you must subtract exactly to zero. If you roll a number which will take you to less than zero, you lose your turn. Partners will alternate turns.

3 Materials and Resources

Overhead projector
“Problem of the day” transparency
Dice for each team
Tape
Pencil
Paper
Activity sheets 1, 2, and 3.
Teacher’s manual Houghton Mifflin Mathematics
“Hands-On Number and Operations” Grades 3-8 by Scott Purdy, Sharon Rodgers, Linda Sue Brisby, Andy Heidemann, Natalie Hernandez, Jeanette Lenger, Ron Long, Petti Pfau. Hands On, Inc. Solvang, California
(reproduction permitted)

4 Assessment

The students will be informally assessed during class discussions, with the Activity Sheets and with an activity sheet on the following day. They will also be assessed during the activities as the teacher walks around and observes.

Activity sheet for assessment:

Name _____ Date _____

List all factor pairs. Then identify each number as prime or composite.

1. 87
2. 33
3. 40
4. 94
5. 51
6. 88
7. 45
8. 76
9. 37
10. 79

How many of the prime numbers between 1 and 100 are even numbers? Explain.

5 Enrichment (Optional) No enrichment in this lesson.

Word Document- Problem of the day.

Josh wrote a four-digit number on his paper. The tens digit was 3 times greater than the ones digit. The number, when rounded to the greatest place, was 5,000. Each digit was even and the sum of the digits was 20. What number did Josh write? 4,862.