



Overview

Students will use the calculator to investigate the patterns formed by remainders in whole-number division.

Grade Levels: 3–5




Concepts

- Whole numbers
- Division



Materials

-  TI-10 or TI-15 Explorer™ calculators
- Student activity sheet
- Pencils or markers



Assessment

Throughout the activity, questions are included for formative assessment. Student work should be used as a check for understanding. Have the students use the TI-10 or the TI-15 Explorer™ calculator to complete the activity.



Introduction

1. Have students discuss the possible remainders that can occur when dividing by seven.
2. Ask students: *Does any one remainder occur more often than any other? Explain your reasoning.*
3. On the activity sheet, have students make a key by choosing a different color to identify each possible remainder, including zero.
4. Have students use $\boxed{\text{int} \div}$ on the TI-15 Explorer™ or $\boxed{\div}$ on the TI-10 to divide each number on the hundred chart (see the activity sheet) by seven. To record the remainders, have students color the square on the hundred chart the color that represents its remainder on the key.

Example:

$19 \boxed{\text{int} \div} 7 \boxed{=} 2 r 5$ on the TI-15 Explorer™ or $19 \boxed{\div} 7 \boxed{=} 2 r 5$ on the TI-10. If the color that represents the remainder 5 on the key is blue, students should color square blue.

Now have students look for patterns.

Collecting and Organizing Data



While students are generating and recording their data, ask questions such as:

Questions for Students:

- ❖ *What remainders occur when you divide by seven?*
- ❖ *What patterns do you notice on the hundred chart?*
- ❖ *What do these patterns tell you about the remainders that are occurring?*
- ❖ *What would happen if you divided by four instead of seven? By ten? How would your data look? Try it.*



Using the Calculator

- How are the displayed quotient and the remainder related to the original number (the dividend)?
- How did you use the calculator to help you collect data in this activity?
- On the TI-15 Explorer™, how is the  key different from the  key?

Analyzing Data and Drawing Conclusions

After students have explored with several divisors, have them analyze the patterns that they have seen. Ask questions such as:

Questions for Students:

- ❖ What patterns did you find in your data?
- ❖ Why do the colors go in a particular sequence on the hundred chart?
- ❖ What happened to the remainder when the dividend increased by one (and the divisor remained the same)?
- ❖ What happened when you used a different divisor? How did the patterns change? How did they stay the same?
- ❖ What do you think would happen if you continued beyond 100? Would the patterns continue? Why or why not?
- ❖ What color would 1,000 be?
- ❖ What general statements could you make about remainders in the whole-number division?

Continuing the Investigation

Ask students to describe situations in which it would be useful to know the patterns in remainders in whole-number division.



SOLUTIONS



Name _____

Date _____



Focus: Find patterns formed by remainders when dividing.

Recurring Remainders

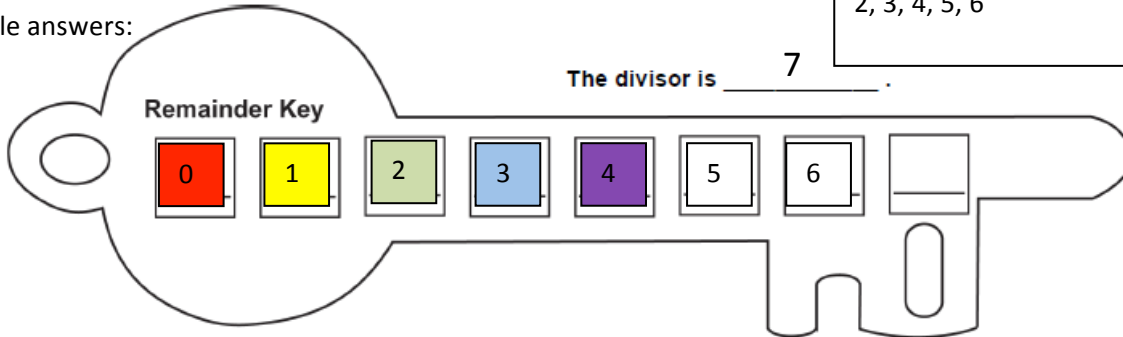
Collecting and Organizing Data

Answer: Remainders in remainder key should be: 0, 1, 2, 3, 4, 5, 6

Sample answers:

The divisor is 7.

Remainder Key



Hundred Chart

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

Patterns we found while we were doing this activity: Color Pattern repeats every 7 numbers.