

**TxCETP Course Component:**

**An Introduction to Ratio and Proportion for  
Preservice Elementary Teachers**

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## Introduction

### Objectives:

The student will use concrete examples and tables to develop a conceptual understanding of ratio and proportional relationships. The student will be able to extend this understanding to problem solving situations.

### Connections to TEKS:

#### **Patterns, Relationships, and Algebraic Thinking:**

2.6, 3.7, 4.7, 5.5, 5.6, 6.3, 6.4, 7.3, 7.4, 8.3, 8.4, 8.5

#### **Underlying Processes and Mathematical Tools:**

2.14, 3.17, 4.16, 5.16, 6.12, 6.13, 7.14, 7.15, 8.15, 8.16

### Connections to ExCET Standards for EC-4 and 4-8:

#### **Standard II: Patterns and Algebra**

**EC-12:** 2.1k, 2.2k, 2.4k, 2.7k

**EC-4:** 2.1s, 2.3s, 2.4s, 2.6s

**4-8:** 2.8s, 2.9s

#### **Standard V: Mathematical Processes**

**EC-12:** 5.3k, 5.4k, 5.5k, 5.6k, 5.7k, 5.7s, 5.9s, 5.14s, 5.19s, 5.20s, 5.21s, 5.23s, 5.24s

#### **Standard VII: Mathematics Learning and Instruction**

**EC-12:** 7.6s, 7.7s, 7.8s, 7.9s, 7.14s, 7.15s, 7.17s, 7.20s

#### **Standard IX: Professional Development:**

**EC-12:** 9.5s

**Prerequisites:** None

### Materials:

- Centimeter “rainbow” cubes (or other colored objects) for each student group. At least two colors are necessary. It is recommended that the cubes be placed in ‘sandwich’ bags in order to be easily distributed for the activity. Approximately 40 cubes per bag are sufficient.
- One copy of **Table 7** and **Table 8** per *student group*.
- An overhead copy of **Table 7** and **Table 8** for the instructor.  
(The tables are taken from: Algebra Thinking: First Experiences by Linda Charles Holden, published by Creative Publications, 1990.)
- Overhead “rainbow” centimeter cubes or colored transparency markers for the instructor.
- Copies of the problem worksheet and homework *for each student*.
- An overhead copy of the problem worksheet and homework for the instructor.

## Instructional Game Plan:

This lesson is intended to be done as a combination of in-class small group (2-4 students) activities and teacher-led discussion. During the activities the teacher should “roam” the room and promote the discovery of patterns and other insights through the use of “leading” questions. After each group activity teacher-led discussion will provide summation, clarification, and closure to the ideas gained in the activity.

(As an alternative, students may be given Table 7 and Table 8 as work to be done outside of class prior to the class period in which the instruction will occur. In such case the students should make number tables to illustrate their work and should come to class with a summary of the patterns they observe in the tables.)

**Estimated Time:** 20 – 30 minutes

## Activities:

In small groups students use “rainbow” centimeter cubes and patterning to complete Table 7 and Table 8. These tables involve proportional relationships between two colors of cubes. They then construct corresponding number tables and look for patterns of addition and multiplication in the tables. Teacher-led discussion follows to insure that all key concepts are discovered. The teacher then asks the students to work in groups to represent the relationship between blue cubes and green cubes in Table 8 abstractly. A teacher-led discussion follows. The students are then given application problems to solve in small groups by creating tables. Teacher-led discussion again follows to insure that all key strategies are understood. Students are given application problems as homework.

**Assessment:** Students respond to journal prompts for both pre- and post- assessments.

## Citation:

This activity is adapted from a ratio and proportional reasoning activity in the Mathematics Staff Development Module 26: *Before Algebra* by Paul Kennedy, Diane McGowan, Jeff Slomka, Sharon Gronberg, Lowell Bynum; published by the Texas Education Agency.

Table 7 and Table 8 are taken from: **Algebra Thinking: First Experiences** by Linda Charles Holden, published by [Creative Publications](http://www.creativepublications.com/), 1990.

<http://www.creativepublications.com/>

## Resources:

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