Colour Tiles

What are Colour Tiles?

Colour tiles have two square surfaces. They are usually referred to as "square" colour tiles even though they are 3-D objects. Sets usually come with four colours of tiles.

How do Colour Tiles help students?

Colour tiles can be used for explorations, investigations, or games in any of the mathematics curriculum strands. The variety of colours allows the tiles to be used for probability, as well as proportional reasoning. Students can use colour tiles to create, identify, and extend patterns. The patterns can be used to develop algebraic models.

How many are recommended?

Students usually work in pairs or small groups, when using colour tiles. A class set of about 700 to 1000 pieces allows students to do a variety of activities. Students can make paper versions. Many colour-tile activities can be done with connecting cubes. When students first use colour tiles, allow for exploration time. A transparent set is useful for overhead demonstrations by students and/or teachers.

Sample Activities

1. Build a tile train. What colour is the 200th cube in the train?

2. How many different ways can you use tiles to represent $\frac{3}{4}$ (or a decimal, or a percent)?
3. Use two different colours of tiles to model integer questions. (Note: The number of tiles represents size and the colour of tiles represents sign.)
4. Design a sequence of patterns. Analyse the pattern and determine an attribute of the 100th term in the sequence (connect to algebraic modelling).
5. Explore relationships between perimeter and area.
6. Put different coloured tiles into a paper bag. Determine the probability of choosing a yellow tile.
7. Create a pattern. Draw its reflection and check your answer using a mirror.
8. Pick any number. Determine if the number is prime by using colour tiles. (Note: If the number is prime, there will be only one possible rectangular arrangement of the tiles – a single row.)
9. Use the colour tiles to show all possible factors of 24.
10. Model the ratio 4:1 using four red tiles and one yellow tile. Place the tiles in a row. Add a second identical row and discuss similarities and differences. Continue adding rows until there are 100 tiles in total. How does this illustrate that $\frac{4}{5}$ is the same as 80%?
11. Let *r* dollars represent the value of one red tile. Let *y* dollars represent the value of one yellow tile, and so on. Determine an expression that represents the total value of a collection of tiles. Combine two different collections and determine an expression for the total value of the new combined collection. Assign a dollar value to each different coloured tile and use the algebraic expression to determine the total value.
12. Use patterns to develop algebraic models. Develop understanding that two different algebraic models can be simplified to show equivalence.

light tiles: **n**
dark tiles: **n(n-1)**

light tiles: **$(n - 2)^2$**
dark tiles: **$2n + 2(n-2)$**

light tiles: **$2n - 1$**
dark tiles: **$(n - 1)^2$**

Total number of tiles = (number of light tiles) + (number of dark tiles), so:

$n + n(n - 1)$ is equivalent to **$(n - 2)^2 + 2n + 2(n-2)$** and to **$(2n - 1) + (n - 1)^2$**

Recommended Websites

http://matti.usu.edu/nlvm/nav/grade_g_3.html Interactive Tiles (go to Algebra – Gr. 6-8, Polyominoes)

http://mathcentral.uregina.ca/RR/database/RR.09.98/loewen2.4.html Selection of Activities

http://math.rice.edu/~lanius//Lessons/Patterns/rect.html Pattern Challenge