UMATH X

Concept: Multiplying Fractions

Name:

COMPUTER COMPONENT

Instructions: In **UMATH X** follow the **Content Menu** path:

Fractions > **Multiplying Fractions**

⌨ Work through all Sub Lessons of the following Lessons **in order**:
- *Pattern Blocks*
- *Fraction Strips*
- *Word Problems*
- *A Summary*
- *The Meaning of "Of"*
- *Order in Multiplying*
- *Multiplying Fractions with Large Numbers*
- *Multiplying Many Fractions*

✏ As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

NOTES

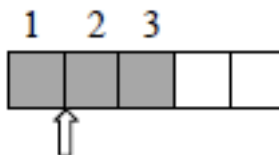1. Pattern blocks are manipulatives that provide an effective *concrete* visual of how to multiply fractions

   On the following hexagon,

   (a) Divide the hexagon into 6 equal parts.

   (b) Shade $\dfrac{1}{3}$ of it.

   (c) Shade $\dfrac{1}{2}$ of that which you shaded in (b).

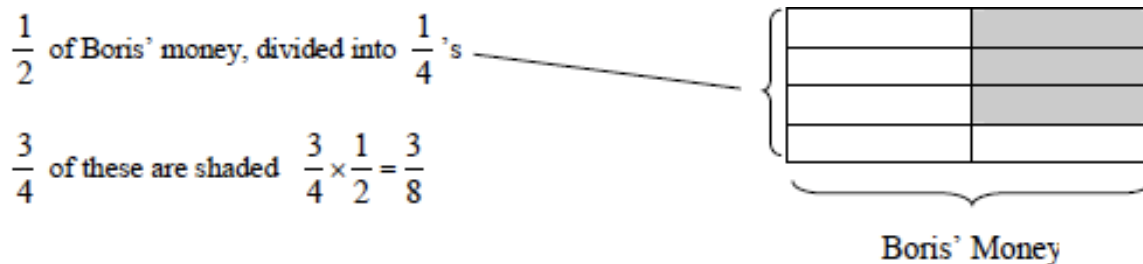   (d) What is $\dfrac{1}{2}$ of $\dfrac{1}{3}$? $\dfrac{1}{6}$
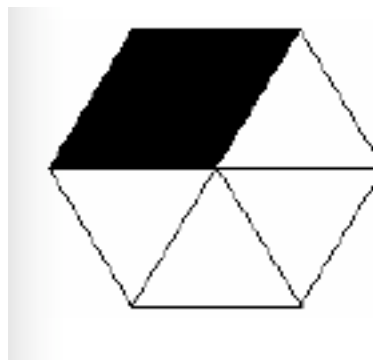
2. Use the following fraction strip to help you with this question.

$$\frac{1}{3} \text{ of } \frac{3}{5} = \frac{1}{3} \times \frac{3}{5} = \frac{3}{15} = \frac{1}{5}$$

3. Without realizing it, we are required to multiply fractions quite often in our daily lives.

Boris spent $\frac{3}{4}$ of $\frac{1}{2}$ of his allowance. *Give the solution to this question below.*

$\frac{1}{2}$ of Boris' money, divided into $\frac{1}{4}$'s

$\frac{3}{4}$ of these are shaded $\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$

Boris' Money

4. Does order matter when we multiply fractions? *(Would we get the same result if we changed $\frac{3}{4} \times \frac{1}{2}$ to $\frac{1}{2} \times \frac{3}{4}$?)* **Explain**

   Order does not matter when multiplying fractions…

   $$\frac{3}{4} \times \frac{1}{2} = \frac{3}{8} \textit{ which is the same as } \frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$$

5. Multiplying fractions with large numbers can sometimes seem like a daunting task.
   Remember: *There are always more efficient ways of doing things.*

   Example 1:

   $$\frac{39}{32} \times \frac{16}{26} = \frac{39 \times 16}{32 \times 26} = \frac{624}{832} = \frac{3}{4}$$

   There is an easier way.

   $$\frac{39}{32} \times \frac{16}{26} = \frac{39}{26} \times \frac{16}{32} = \frac{3}{2} \times \frac{1}{2} = \frac{3}{4}$$

   Example 2:

   $$\frac{15}{34} \times \frac{51}{60} = \frac{51 \times 51}{60 \times 34} = \frac{765}{2040} = \frac{3}{8}$$

   There is an easier way.

   $$\frac{15}{34} \times \frac{51}{60} = \frac{15 \times 51}{60 \times 34} = \frac{1 \times 3}{4 \times 2} = \frac{3}{8}$$

6. Don't be thrown by a question that has many numbers in it. *Take your time and apply your newly acquired knowledge.*

Example 1:

$$\frac{16}{21} \times \frac{15}{4} \times \frac{7}{20} = \frac{7}{21} \times \frac{16}{4} \times \frac{15}{20} = \frac{1}{3} \times \frac{4}{1} \times \frac{3}{4} = \frac{12}{12} = 1$$
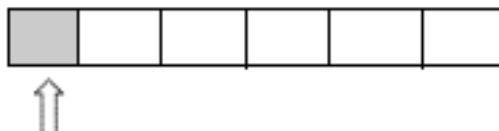
Example 2:

$$\frac{25}{14} \times \frac{16}{45} \times \frac{49}{40} = \frac{25}{45} \times \frac{49}{14} \times \frac{16}{40} = \frac{5}{9} \times \frac{7}{2} \times \frac{2}{5} = \frac{7}{9}$$
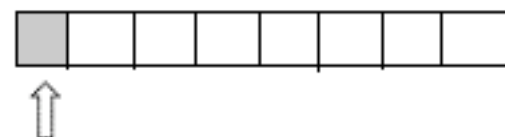
OFF COMPUTER EXERCISES

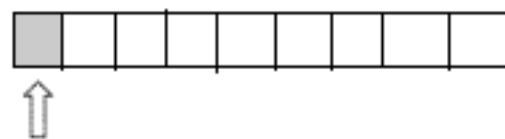1. Using each bar below, shade in the product of the following fractions.

(a) $\dfrac{1}{2} \times \dfrac{1}{3} =$

(b) $\dfrac{1}{4} \times \dfrac{1}{2} =$

(c) $\dfrac{1}{3} \times \dfrac{1}{3} =$

2. Multiply the following fractions. *Your answer should be in lowest terms.*

(a) $\dfrac{1}{2} \times \dfrac{3}{4} = \dfrac{3}{8}$

(b) $\dfrac{4}{5} \times \dfrac{5}{8} = \dfrac{1}{2}$

(c) $\dfrac{8}{9} \times \dfrac{3}{4} = \dfrac{2}{3}$

(d) $\dfrac{1}{8} \times \dfrac{1}{9} = \dfrac{1}{72}$

(e) $\dfrac{2}{3} \times \dfrac{4}{3} = \dfrac{8}{9}$

(f) $\dfrac{1}{3} \times \dfrac{4}{5} \times \dfrac{3}{7} = \dfrac{4}{35}$

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3. Multiply the following fractions. *Remember to use the skills you learned in Multiplying Fractions With Large Numbers.*

(a) $\dfrac{10}{12} \times \dfrac{4}{5} = \dfrac{2}{3} \times \dfrac{1}{1} = \dfrac{2}{3}$

(b) $\dfrac{11}{14} \times \dfrac{2}{33} = \dfrac{1}{7} \times \dfrac{1}{3} = \dfrac{1}{21}$

(c) $\dfrac{21}{25} \times \dfrac{10}{21} = \dfrac{1}{5} \times \dfrac{2}{1} = \dfrac{2}{5}$

(d) $\dfrac{20}{30} \times \dfrac{30}{40} = \dfrac{1}{1} \times \dfrac{1}{2} = \dfrac{1}{2}$

(e) $\dfrac{15}{18} \times \dfrac{12}{25} = \dfrac{3}{3} \times \dfrac{2}{5} = \dfrac{2}{5}$

(f) $\dfrac{64}{78} \times \dfrac{27}{40} = \dfrac{8}{26} \times \dfrac{9}{5} = \dfrac{4}{13} \times \dfrac{9}{5} = \dfrac{3}{6}$

(g) $\dfrac{16}{17} \times \dfrac{5}{8} \times \dfrac{4}{15} = \dfrac{16}{17} \times \dfrac{1}{2} \times \dfrac{1}{3} = \dfrac{16}{102}$

(h) $\dfrac{14}{15} \times \dfrac{5}{7} \times \dfrac{6}{21} = \dfrac{2}{5} \times \dfrac{5}{7} \times \dfrac{2}{3} = \dfrac{4}{21}$

(i) $\dfrac{18}{16} \times \dfrac{8}{9} \times \dfrac{3}{20} = \dfrac{2}{2} \times \dfrac{1}{1} \times \dfrac{3}{20} = \dfrac{3}{20}$

(j) $\dfrac{3}{24} \times \dfrac{16}{14} \times \dfrac{21}{27} = \dfrac{1}{3} \times \dfrac{2}{2} \times \dfrac{3}{9} = \dfrac{1}{9}$

4. Philippe lives $\dfrac{8}{11}$ of a kilometer from Sarah. Philippe walked $\dfrac{1}{4}$ of the way to Sarah's house, and then got a ride from his dad for the rest of the way.

   How far did Philippe walk?

$$\dfrac{1}{4} \times \dfrac{8}{11} = \dfrac{1}{1} \times \dfrac{2}{11} = \dfrac{2}{11}$$

Phillipe walked $\dfrac{2}{11}$ kilometres.

5. Grandma baked a pecan pie for the entire family. Grandpa ate $\dfrac{1}{6}$ of the pie. Dad ate $\dfrac{1}{5}$ of what was left. Mom ate $\dfrac{1}{4}$ of what was left after that. My Sister ate $\dfrac{1}{3}$ of what was left after that. I ate $\dfrac{1}{2}$ of what was left after that.

   How much of the original pie was left for Grandma to eat? Who ate the most pie?

Grandpa: $\dfrac{1}{1} \times \dfrac{1}{6} = \dfrac{1}{6} = \dfrac{6}{6} - \dfrac{1}{6} = \dfrac{5}{6}$ **Dad:** $\dfrac{5}{6} \times \dfrac{1}{5} = \dfrac{5}{30} = \dfrac{25}{30} - \dfrac{5}{30} = \dfrac{20}{30}$

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Mom: $\dfrac{20}{30} \times \dfrac{1}{4} = \dfrac{20}{120} = \dfrac{80}{120} - \dfrac{20}{120} = \dfrac{60}{120}$ *Sister:* $\dfrac{60}{120} \times \dfrac{1}{3} = \dfrac{60}{360} = \dfrac{180}{360} - \dfrac{60}{360} = \dfrac{120}{360}$

Myself: $\dfrac{120}{360} \times \dfrac{1}{2} = \dfrac{120}{720} = \dfrac{240}{720} - \dfrac{120}{720} = \dfrac{120}{720} = \dfrac{1}{6}$

Grandma: $\dfrac{1}{6}$ *of the pie is saved for grandma.*

6. Perry got up early one morning to surprise his wife with a cup of her favorite blend of coffee. Perry uses regular coffee and a decaf- blend that is $\dfrac{1}{2}$ regular and $\dfrac{1}{2}$ decaffeinated coffee. He puts 4 tablespoons of the decaf-blend and 3 tablespoons of regular in the coffee maker. *What is the fraction of regular coffee in Perry's mixture?*

$\dfrac{1}{2} of\ 4 = \dfrac{4}{2} = 2 tablespoons$ *of regular coffee in the decaf-blend + 3 tablespoons of*

regular coffee= 5

Total tablespoons of both mixed and decaf coffee= 7

Fraction of regular coffee in Perry's mixture $\dfrac{5}{7}$

7. Simon decided to create a flowerbed in front of his house. $\dfrac{1}{2}$ of his flowerbed is planted with orange marigolds. He plants $\dfrac{3}{4}$ of the rest of the garden with red roses. After that, he plants pink orchids in $\dfrac{1}{2}$ of what remains. The rest of the garden is planted with yellow daffodils. *What fraction of his garden is planted in yellow daffodils?*

Orange Marigolds: $\dfrac{1}{1} \times \dfrac{1}{2} = \dfrac{1}{2} = \dfrac{2}{2} - \dfrac{1}{2} = \dfrac{1}{2}$

Red Roses: $\dfrac{1}{2} \times \dfrac{3}{4} = \dfrac{3}{8} = \dfrac{4}{8} - \dfrac{3}{8} = \dfrac{1}{8}$

Pink Orchids: $\dfrac{1}{8} \times \dfrac{1}{2} = \dfrac{1}{16} = \dfrac{2}{16} - \dfrac{1}{16} = \dfrac{1}{16}$

Yellow Daffodils: $\dfrac{1}{16}$ *is devoted to yellow daffodils.*

8. *How much pizza is left for Juanita to eat?* Use your knowledge of *Multiplying Fractions* to create a scenario that would be best suited for this question.
(Responses will vary)

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