# Summer Math

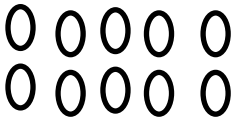
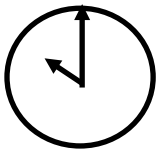
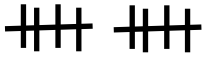
# Educator Packet

# Unit 3

## Warm up: Target Number

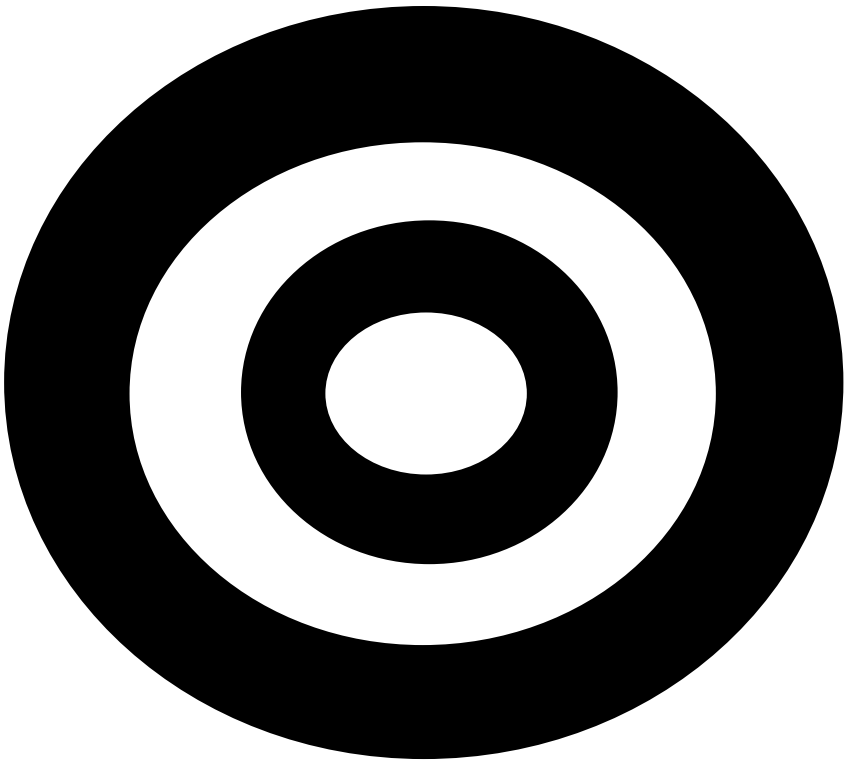
- The task is to represent the target number in different ways in one minute. Do a couple samples with students before starting the timer.
    a. Start all groups with the numbers 12 and 15.
        i. All target numbers are fair to use with students in grades 1 through 8.
        ii. Use numbers 20 and under for any "Cat-Icon" students in the group.
- Set the timer for one minute.
- Educators play along, and write examples to share related to the students' required math fluencies:
- At the end of the minute, students give ONE example at a time, going around the group a couple of times until all DIFFERENT responses are used. Students need to give **different** ways to represent the number. Writing, "7 + 3" is different from writing, "3 + 7". Drawing 7 circles and 3 circles is different from writing, "7 + 3."

***Examples of some different ways to represent the number 10:***

| | | | | | |
|---|---|---|---|---|---|
| 7 + 3 | 10 + 0 | 17 – 7 | 2 x 5 | 100 / 10 | 20/2 |
| 3 + 7 | 0 + 10 | ten | 5 x 2 | 10/1 | 10 x 1 |
|  | |  | |  |  |
| One dozen eggs take away 2 | | 2 + 2 + 2 + 2 + 2 | | | 100 - 90 |

## Required [Math] Fluencies

| | | |
|---|---|---|
| Kindergarten | Add and subtract within 5 | ***Procedural Fluency***: can easily use a process to figure out the answer (for example, using manipulatives, diagrams) |
| Grade 1 | Add and subtract within 10 | ***Procedural Fluency*** |
| Grade 2 | Single digit sums and differences (automaticity by the end of Grade 2);<br>Add and subtract within 100 | ***Automaticity*** by the end of Grade 2: Knows the answer without stopping to use a process to figure out the answers. |
| Grade 3 | Single digit products and quotients (product automaticity by the end of Grade 3) | ***Automaticity for Products*** by the end of Grade 3 |
| | Add and subtract within 1,000 | ***Procedural Fluency*** |
| Grade 4 | Add and subtract within 1,000,000 | ***Procedural Fluency*** |



# Target Number

**<u>Suggested Target Numbers</u>: Start with 12 and 15 for everyone for the first two sessions.** Afterwards, numbers over 20 are fair for all grade bands except for the DOG ICON, which should just use numbers under 20**.**

| | | | |
|---|---|---|---|
| 12 | 15 | 24 | 36 |
| 60 | 48 | 100 | 45 |
| 90 | 50 | 75 | |

**More choices:** 9 18 6 20

## FAMILY FUN GAME Directions

**Key Points:**

- Starting with Unit 2, the Family Fun Game gives students repeated practice in each of the Math Matters skills. This allows students to practice all of the skills throughout the summer.

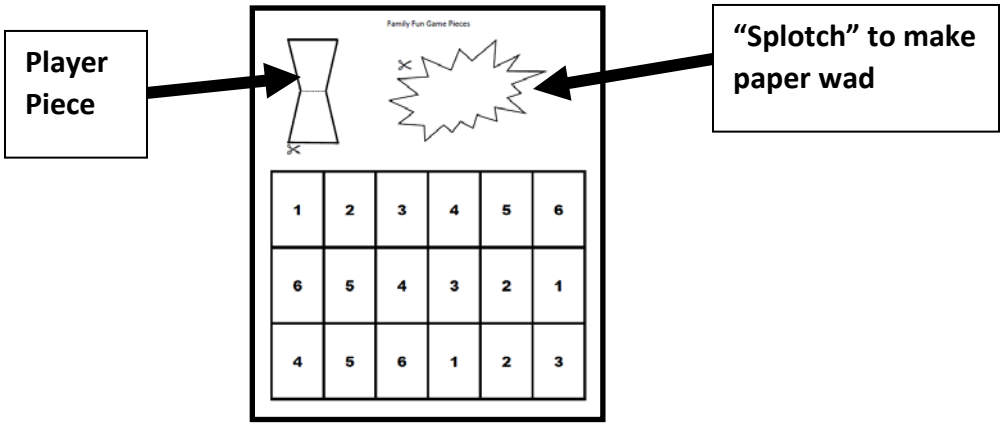
**Process:**

1. Each Student Packet has its own Family Fun Game Cards, allowing each student to participate with students who have different skills to practice.
2. Do not cut the cards apart! Starting with Lesson 2, the three cards in each row will practice the same skill.
3. Instead of students drawing a card, students select a problem from their grade band sheets. Students can select problems in the order they choose, BUT ask students to solve one problem from each row, before repeating from the row, so they practice each skill.
4. Game Directions are on the game board. Game boards are at the end of each Student Packet, so they are easy to pull off and use.
5. The best way to move around the board is to use dice. The Student Packets have a "Do It Yourself (DIY)" version to toss a small wad of paper onto a board of numbers.
6. Many students end up reading all of the problems in between turns as they search for the "best" ones to answer.

## Do It Yourself (DIY) Game Pieces

**Player:** Cut the outside of the double trapezoid. Fold in half to make the player. If more than one student has the same color, students can write their names on the playing piece.

**If you don't have a 6-sided die:** Cut around the jagged "splotch" shape and wad the paper into a ball. Toss the ball onto the number board to find number of spaces to move.



**BLM Unit 3, Follow-Up Lesson 3 Family Fun Game All Level Answer Key**

| Problem | Kinder (pink) | 1-2 (blue) | 3-4 (green ) | 5-6 (yellow) | 7-8 (peach) |
|---|---|---|---|---|---|
| **A** | 15 dots<br>Number 15 | 7 + 6 = 13<br>6 + 7 = 13<br>13 -7 = 6<br>13 – 6 = 7 | 0.9 | 2.26 | 7.5 units |
| **B** | 5 butterflies<br>Number 5 | 5 + 8 = 13<br>8 + 5 = 13<br>13 – 5 = 8<br>13 – 8 = 5 | 0.06 | 1/6 | 36 units |
| **C** | 9 stars<br>Number 9 | 7 + 9 = 16<br>9 + 7 = 16<br>16 – 9 = 7<br>16 – 7 = 9 | 0.4 | 32,770.77 | 5 units |
| **D** | Count out 8 counters | 8, 2 make ten | solve for 169 | 210.55 | 25 x 30 |
| **E** | Count out 15 counters | 3, 7 make ten | solve for 143 | 0.75 | 10.42 feet |
| **F** | Count out 10 counters | 5, 5 make ten | solve for 195 | 0.07 | L = 7 inches<br>W = 2.8 inches |
| **G** | 12 ants | 14 + 5 = 19<br>Sue read 19 picture books. | 0.45, 0.75 | 0.05, 5% | $0.20 |
| **H** | 10 leaves | 13 – 9 = 4<br>Eddie picked up 4 fewer rocks. | 0.7 0.56 | 9 | $4 |
| **I** | 3 bugs | Divided into 2 equal or same size pieces. | 0.08 0.9 | 18 | $1.33 or $1.34 |
| **J** | 2 eggs | 4 tens and 5 ones<br>(now count them)<br>45 | 4/6<br>They are equivalent | 4 tiles 1 color<br>1 tile another color | $10.75 (pennies difference for rounding is acceptable) |
| **K** | 10 eggs | 3 tens and 9 ones<br>(now count them)<br>39 | 1/2<br>5/8 is just a little more than a half; 1/3 is smaller than 1/2 | 5 tiles 1 color<br>3 tiles another color | $26.22 (pennies difference for rounding is acceptable) |
| **L** | 8 were brown | 6 tens and 6 ones<br>(now count them)<br>66 | 1/4<br>They are equivalent | 3 tiles 1 color<br>7 tiles another color | $14.09 (pennies difference for rounding is acceptable) |
| **M** | Penny | 5 | 8/10 = 0.8 | 3:4 and 3/4 | 1.5 hr or<br>1 ½ hours |
| **N** | Penny | 12 | 4/10 = 0.4 | 6:1 and 6/1 | 3 hours |
| **O** | Dime | 46 | 7/10 = 0.7 | 3:5 and 3/5 | 9 hours |
| **P** | Blue set<br>On bottom | Ally had 33 cupcakes. | 5 x 4 = 20<br>4 x 5 = 20<br>20 ÷ 5 = 4<br>20 ÷4 = 5 | x = 3 | 16/1 = x/3 OR<br>1/16 = 3/x |
| **Q** | 9 (red) ovals on right | 12 cupcakes were not eaten. | 24 | x = 9 | 12/1 = x/4 OR<br>1/12 = 4/3 |
| **R** | 10 (red) hearts on left | 17 cupcakes were left. | 5 | x = 9 | 36/1 = x/12 OR<br>1/36 = 12/x |

## CGI CHARTS:

With a few changes, Math Matters' CGI Chart is in New York State's Next Generations Learning Standards for Grade 3 and Grade 4 for use with multiplication and division word problems involving Equal Groups and Arrays and Area Problems.

**Key Points:**

- Allows students to solve the problem in a way they understand, instead of the "right" way.
    - **NY-3.OA.3 –** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.
        - E.g., using drawings and equations with a symbol for the unknown number to represent the problem.
    - **NY-4.NBT.5 –** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations.
        - Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

**Process:**

1. ***Pick one word problem.*** Spend time on the process instead of a quick answer.
    - For Grade Band 3-4, the multiplication/division terms on the (English) CGI Chart have been updated to represent the Next Generation terminology changes.
        - The "Compare" row of addition/subtraction problems remains for use to practice addition and subtraction during the summer.
        - Use the STAR (Grade 3) ★ or the TRIANGLE (Grade 4) ▲ for types of word problems on the summer math assessments.
2. **Read the problem to students,** using the choice of differentiated numbers to fill in the blanks.
3. ***Read again and encourage students to take notes on the graphic organizer***. (modeling, teaching the first time)
4. ***Give students time to solve.*** (If struggling, prompt with, "What number does the problem start with?" Do you want to draw this or use manipulatives to recreate it?)
    a. Have manipulatives and paper for students to choose either medium for solving the problem.
5. ***Ask students to explain their process before asking them for an answer.*** This allows students time to self-correct and gives the Educator a clue about how the student is thinking.
6. ***At the end, look at the final answer together, to decide if it solves the problem***. How would you say this in a sentence?

| | | | |
|---|---|---|---|
| **Compare** | *(Difference Unknown)*<br><br>A nest of house mice ate ___ grains of rice and ___ crumbs. How many more crumbs did the mice eat than grains of rice?<br><br>(99,103) (199,225) (64,202) | *(Bigger Unknown)*<br><br>Mice will nest with their relatives. One nest had ___ deer mice. It had ___ fewer house mice than deer mice. How many house mice were in the nest?<br><br>(43,17) (28, 19) (61, 47) | *(Smaller Unknown)*<br><br>Mice will nest with their relatives. One nest had ___ deer mice. That was ___ more than house mice. How many house mice were in the nest?<br><br>(34, 16) (23, 14) (57, 29) |

| | **Unknown Product**<br>**a x b = ?** | **(Group Size Unknown)**<br>**a x ? = p and p / a = ?** | **(Number of Groups Unknown)**<br>**? x b = p and p / b = ?** |
|---|---|---|---|
| **Equal Groups** | A mouse had __ litters of babies (pups). There were __ pups in each litter. How many pups in all?<br><br>(6, 7) (7, 8) (11, 14) | A mother mouse had __ babies (pups) over a period of time. There were __ pups in each litter. How many litters did the mother have?<br><br>(56, 7) (72, 6) (125, 5) | A mouse eats 15 times a day *(true).* If it eats __ grains of rice each day, how many grains does it eat at each feeding?<br><br>(45) (75) (150) |

**Unit 3 CGI Problems for *Monster in the Mattress and Other Stories***

| | | | |
|---|---|---|---|
| **Comparar** | *(Diferencia desconocida)*<br><br>Una nidada de ratones caseros comió ---- granos de arroz y ---- migas.<br>¿Cuántas más migas que granos de arroz comieron los ratones?<br><br>(99, 103) (199, 225)<br>(64, 202) | *(Cantidad desconocida)*<br><br>Los ratones anidan con sus parientes. Un nido tenía ---- ratones ciervos.<br>Este tenía --- menos ratones caseros que ratones ciervos.<br>¿Cuántos ratones había en el nido?<br><br>(43, 17) (28, 19) (61, 47) | *(Referente desconocido)*<br><br>Los ratones anidan con sus parientes. Un nido tenía ---- ratones ciervos.<br>Esto era ---- más que ratones caseros.<br>¿Cuántos ratones caseros había en el nido?<br><br>(34, 16) (23, 14)<br>(57, 29) |

| | **Multiplicación** | **Medición de División** | **División Partitiva** |
|---|---|---|---|
| **Agrupación y Partición** | Una mamá ratona tuvo ---- camadas de bebés (cachorros). Había ---- cachorros en cada camada.<br>¿Cuántos cachorros en total?<br><br>(6, 7) (7, 8) (11, 14) | Una mamá ratona tuvo ---- bebés (cachorros) en un periodo de tiempo. Había ---- cachorros en cada camada. ¿Cuántas camadas tuvo la madre?<br><br>(56, 7) (72, 6) (125, 5) | Un ratón come 15 veces al día (verdadero). Si come ---- granos de arroz. Si come ---- granos de arroz cada día.<br>¿Cuántos granos de arroz come en cada comida?<br><br>(45) (75) (150) |

**Math Objectives**
- Construct pictorial models of fractions.
- Compare fractional parts of a whole.
- Use fraction names and symbols to describe fractional parts of a whole.
- Use pictorial models to generate equivalent fractions.
- Compare fractions using pictorial models.

**Language Objectives**
- Discuss fraction comparisons.
- Discuss fraction equivalencies.

**Vocabulary**
halves
thirds
sixths

**Materials:**
- 1 per student
- **BLM** Jerky Fractions ( 2 pages)
- **BLM (KEY)**

**Per Partners:**
- 6 pieces of jerky
- 2 paper plates
- 2 paper towels
- 2 scissors
- Chart paper with question**:** ***Tell what this statement means, whether it is true or false, and explain why***. **When you look at number representations of fractions without models, you have to imply that the "whole" they represent are the same size if you are going to compare them.** Put a copy of the record sheet at the top of the chart with the question.

# Unit 3, Lesson 2 3-4

## Snack Fractions

***Children should wash their hands before this activity if using food items.***

**Snack Fractions**
As part of each math day, please include a quick "Snack Fraction" activity. If your district/school does not allow any snacks to be given to students, please alter the activity by providing the paper shape to be divided into fractional parts.

Have students look at the two record sheets for this activity.
- What is similar to lesson 1, the dill pickle snack?
- What is different from lesson 1, the dill pickle snack?

Do look now at the snack.
- What do you have to share? (*six pieces of jerky*)
- Talk to your partner now about how you will share the snack fairly between you. When you have a plan, raise your hand and share your plan with me. (*Circulate the room listening to the partners' discussions. Let them share the jerky first, then continue with the rest of the activity.)*

*(Ask of the whole class)*
- How did you share your jerky between you?
- How was today's sharing different from Lesson 1, dill pickle?
- How do you know you each have half?

Work with the rest of the sharing and comparing you are asked to do on the record sheets. *(Circulate the room.)*
- What do you call one of these portions?
- How many of these portions make a whole?
- Which is larger (*compare two fractional portions)?*
- When you think about the fractional portion of the jerky, how does the NUMBER representation compare to the NUMBER representation?
- How would one-fourth compare to this fraction? How do you know? (*Compare to each of the fractional portions – only 1/2 is larger.*)
- Can you tell me a way that you can tell by looking at a number unit fraction representation, which fractional piece is larger?
- Show me how you found an equivalent fraction for 2/3.
- What would you call two of these pieces *(sixths)*? 3? 4? 5? 6?

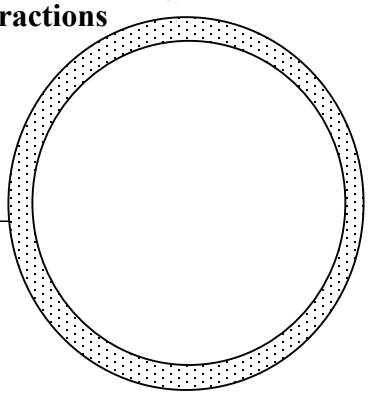
| | |
|---|---|
| **ELPS** (*English Language Proficiency Standards*)<br>4C, 4F, 4G, 5A, 5B, 5C, 5G<br><br>**CCRS** *(College and Career Readiness Standards)*<br>**Math**<br>VIII.A.1,2,3,4,5; VII.B.1,2; VIII.C.1,3; IX.C.1,2,3.<br>**Cross-Disciplinary**<br>I.D.1,2,3,4; I.E.1,2.<br>**ELA**<br>II.A.4.6,7, 10; II.B.1; II.D.1; IV.A.3 | **Unit 3, Lesson 2** **3-4**<br><br>**Snack Fractions -** continued<br><br>**Snack Fraction Journal Writing: Jerky Chart Paper**<br>*Tell what this statement means, whether it is true or false, and explain why.*<br><br>**When you look at number representations of fractions without models, you have to imply that the "whole" they represent are the same size if you are going to compare them.**<br><br>**Objectives:** Review the objectives with the class, making sure they understand how they achieved each. |

**BLM Unit 3, Snack Fraction Lesson 2** **KEY Jerky Fractions**
(One sheet per student)

My name is _____

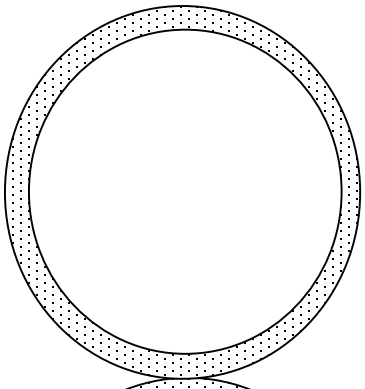
When I share with 1 other friend, my fraction part is ___*one-half*___
(word)

I can represent that fraction with numbers: _____.



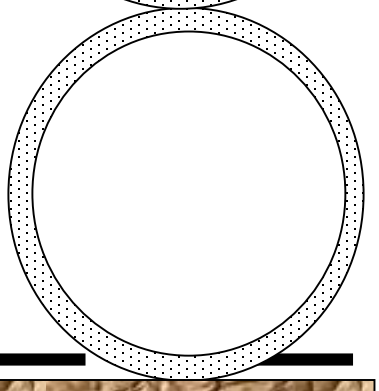
When I share with 2 other friends, my fraction part is __*one-third*___.
(word)

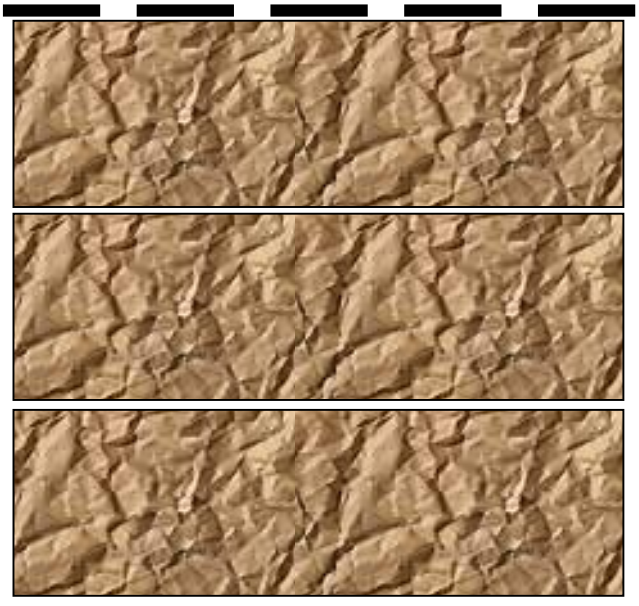
I can represent that fraction with numbers: _____.

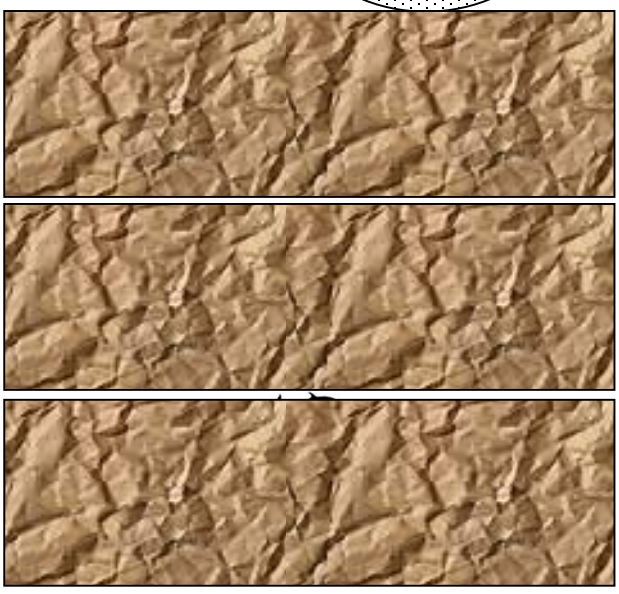


When I share with 5 other friends, my fraction part is __*one-sixth*
(word)

I can represent that fraction with numbers: _____.







First of all, compare the three unit fractions by writing the fractions in the rectangle and using < or > in the circle between the two fractions.
***Students may arrange least to greatest OR greatest to least as long as the signs are correct.***

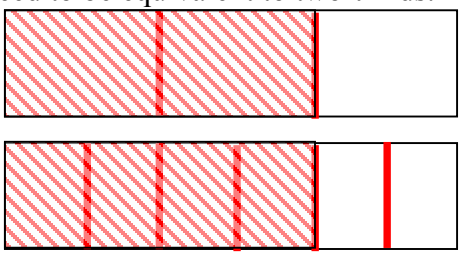
$\frac{1}{2}$ > $\frac{1}{3}$ > $\frac{1}{6}$

Circle the portion you would rather have.

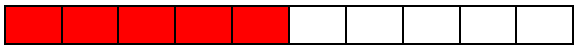
Explain why you would rather have the portion you circled.
***I circled 1/6 because it's the smallest and I don't like jerky***
***(Students could choose either as long as***
***They can defend their choice.)***

Now, use the 2 rectangles below to show how many sixths you would need to be equivalent to two-thirds.

$\frac{2}{3} = \frac{4}{6}$



**Decimals**
Divide the bar in half. Name each portion with a decimal.



*0.5* *0.5*