Meeting 4 Student’s Booklet

A DAY AT THE FAIR

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Example 1: One half = three sixths

We set some conventions and rules to describe fractions of ice cream, and we show in detail why one half (1/2) is equal to three sixths (3/6).

We represent a unit (1) of ice cream with a square full of ice cream:

So to represent one half (1/2) of ice cream, we use the following picture:

Now, we may choose to divide each half of ice cream in 3 parts. This gives:

Note: In the last picture, a part of ice cream is now equal to one sixth (1/6). Since three of these six parts have ice cream, the picture represents 3/6.

Since the second and the third picture represent the same amount of ice cream, this shows that one half is equal to three thirds: 1/2 = 3/6.

We can make even smaller parts if we want: let us divide each sixth of ice cream in two parts. Doing so, we obtain the picture on the right. This shows that 3/6 = 6/12.

Note: If we multiply both the top and the bottom of a fraction by the SAME number, the value of the fraction does not change!

\[
\frac{1}{2} = \frac{3}{6} = \frac{6}{12} = \frac{18}{36} = \ldots
\]
Example 2: One half plus one third

Now we want to add one half of ice cream plus one third of ice cream. In math notation:

1/2 of ice cream + 1/3 of ice cream.

The sum 1/2 + 1/3 corresponds to:

Since the parts have different sizes, we cannot just add them as we were adding integers. The key is to break both parts into smaller parts, all of the same size.

Fast way: This is the same as dividing the original ice cream unit in 6 parts. Then 1/2 = 3/6, 1/3 = 2/6, and so:

1/2 + 1/3 = 3/6 + 2/6 = 5/6.
Example 3: One third plus one sixth

Now we add $\frac{1}{3}$ of ice cream + $\frac{1}{6}$ of ice cream:

Step 1
Divide each third of ice cream in 6 parts:

Step 2
Divide each sixth of ice cream in 3 parts

Step 3
Now we can group all 9 the parts, since they are all the same size. Clearly we obtain one half.

Conclusion: $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$
**Example 3: One third plus one sixth (continuation)**

**Observe:** This is the same as dividing the original ice cream in 18 parts. Then $\frac{1}{3} = \frac{6}{18}$, $\frac{1}{6} = \frac{3}{18}$, and so:

$$\frac{1}{3} + \frac{1}{6} = \frac{6}{18} + \frac{3}{18} = \frac{9}{18} = \frac{1}{2}.$$ 

The general idea is to divide the ice cream unit in a number of parts that is the same for both fractions. In other words:

*Both fractions should have the same denominator*

In this problem we look for a common multiple between 3 and 6. Possibilities: 6, 12, 18, 24, 30, ...

The easiest way to solve to problem by dividing the original ice cream in the **smallest** of these common multiples.

So, \(\frac{1}{3} + \frac{1}{6} = \frac{2}{6} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}\).
In the fabulous IC-Land, the size of our scoops depend on the flavor! 3 scoops of banana ice cream fill your cone.... or 16 scoops of vanilla!

In I-C-Land, all the cones are equal, but the size of scoops depends on the flavor, as the following table indicates:

<table>
<thead>
<tr>
<th>Flavor</th>
<th>Number of scoops to fill out a cone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banana</td>
<td>3</td>
</tr>
<tr>
<td>Chocolate</td>
<td>4</td>
</tr>
<tr>
<td>Strawberry</td>
<td>8</td>
</tr>
<tr>
<td>Vanilla</td>
<td>16</td>
</tr>
</tbody>
</table>

Continues...
a. What fraction of a cone can be filled with 2 scoops of banana and 1 scoop of chocolate ice cream?

b. What fraction of a cone can be filled with 1 scoop of chocolate, 3 scoops of strawberry and 5 scoops of vanilla ice cream?

c. Which cone will be fullest: the one in part a, or the one in part b? Justify your answer.
Ask a similar question, or invent a “story-problem” about cones, and solve it with your group!

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</table>
There are 24 different Chicago wheels, each one having a determined fraction of people inside (shaded regions).

1) Match each wheel with a fraction describing how full it is.

2) How many wheels are less than half-full?

3) Put together wheels that have the same fraction of people.

4) Locate each Chicago wheel in the number line (see next page).

Example 1
The Chicago wheel shown in the picture has 8 zones, 4 of which are full.

Therefore, the fraction that corresponds to this wheel is 4/8, which is the same fraction as 2/4 or 1/2.

This wheel is exactly half-full.

Example 2
The Chicago wheel shown in the picture has 6 zones, 3 of which are full.

Therefore, the fraction that corresponds to this wheel is 3/6, which is the same fraction as 1/2.

This wheel is exactly half-full.

Wheels in examples 1 and 2 have the same fraction of people, so we would put them together in the exercise.
2 CHICAGO WHEELS (number line)

0/1 1/36 2/36 3/36 4/36 5/36 6/36 9/36 12/36 15/36 18/36
0 0.027 0.138 0.166 0.25 0.138 0.166 0.25 0.138 0.166 0.25
0% 2.7% 13.8% 16.6% 25% 13.8% 16.6% 25% 13.8% 16.6% 25%

1/36 1/18 1/12 1/9 1/4 1/3 5/12 1/2

1/6 1/6 1/6 1/6 1/6 1/6 1/6 1/6

36/36 1 0 1 3/4 12/36 15/36 18/36
1 100% 0% 33.3% 41.6% 50%

FULL

18/36 1/2

HALF FULL

3/4

75%

FULL

3/4

75%
A group of five friends love the Amusement Park and plan to go there everyday after school during the year. They stop at the ticketing office to buy entrance tickets. There are four options:

- Monthly pass (30 entries) $44
- Bi-weekly pass (15 entries) $21
- Weekly pass (7 entries) $10
- Daily pass (1 entry) $1.5

Write your process and answers in your notebook

**Cheapest Fare**

Which of the 4 options provides the cheapest fare per day?
Remodeling

The Amusement park has four different attractions, all having equal size: Splash Zone, Wonderland, Spook Land, and Adventureland.

The group of friends were sad: they found out that parts of each section of the park were closed due to remodeling: one sixth of Splash Zones, one third of Wonderland, thirteen twenty sixths (13/26) of Spook Land and four sixths of Adventure Land would be closed to the public.

Can you help them figure out how much of the total park was closed? Express your answer as a fraction. Was more than 50% of the park closed?
Drill A

We want to go from Left to right in the haunted mansion. Each time we choose a road, and add the corresponding value.

1

\[ \frac{7}{9} \]

\[ \frac{7}{16} \]

\[ \frac{4}{7} \]

\[ \frac{5}{13} \]

a) How many itineraries can we choose?  
b) Highlight the itinerary with the smallest sum
Drill B

We want to go from Left to right in the haunted mansion. Each time we choose a road, and add the corresponding value.

a) How many itineraries can we choose?  
b) Highlight the itinerary with the smallest value
Drill C

We want to go from Left to right in the haunted mansion. Each time we choose a road, and add the corresponding value.

a) How many itineraries can we choose?
b) Highlight the itinerary with the smallest value
c) Find the value of the itinerary with the largest value
Drill D

We want to go from Left to right in the haunted mansion. Each time we choose a road, and add the corresponding value. Here, $x$ and $y$ are positive numbers.

a) How many itineraries can we choose?

b) Highlight the itinerary with the smallest value

c) Find the value of the itinerary with the largest value, in terms of $x$ and $y$. 