A budget line is a graph that shows all the possible combinations of 2 goods that can be purchased if all income is spent on those two goods. To draw a budget line, you need to know the prices of the two goods and the amount of income that is available to be spent on those goods.

Example: The consumption of 2 goods: bagels and coffee

In order to draw this budget line, assume the following:

1. you spend all of your monthly income on bagels and coffee
2. your monthly income is $50.00
3. the price of a bagel is $1.00
4. the price of a cup of coffee is $0.50

Questions:

a. What is the opportunity cost of a bagel in terms of coffee?

b. What is the opportunity cost of a cup of coffee in terms of bagels?

Since a budget line gives all the possible combinations of 2 goods that can be purchased if all income is spent, before we can draw it we need to think about the various combinations of bagels and coffee that can be purchased with our income. Of course, there are many potential consumption possibilities. For example, we could spend all our income on bagels, all on coffee, or some combination of bagels and coffee.

Consumption possibilities that use up our $50.00 income:

Fill in the following table according to these consumption possibilities:

- Let consumption possibility 1 (CP1) be the combination that results if you spend all of your income on bagels.
  ⇒ CP1 = _____ units of bagels and _____ units of coffee

- Let consumption possibility 2 (CP2) be the combination that results if you spend all of your income on coffee.
  ⇒ CP2 = _____ units of bagels and _____ units of coffee

- Let consumption possibility 3 (CP3) be the combination that results if you spend half of your income on bagels and half of your income on coffee.
  ⇒ CP3 = _____ units of bagels and _____ units of coffee

- Let consumption possibility 4 (CP4) be the combination that results if you only purchase coffee and bagels in the ratio of 2 Bagels for every 1 Coffee (every time you buy 2 bagels you also buy 1 cup of coffee).
  ⇒ CP4 = _____ units of bagels and _____ units of coffee

- Make up any other combination of bagels and coffee that completely uses up your $50 income.
  ⇒ CP5 = _____ units of bagels and _____ units of coffee
<table>
<thead>
<tr>
<th>Good</th>
<th>CP1</th>
<th>CP2</th>
<th>CP3</th>
<th>CP4</th>
<th>CP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of Bagels</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units of Coffee</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We can draw all these possible combinations of bagels and coffee as a line:

→ Put bagels/month on the vertical axis and coffee/month on the horizontal axis:

→ Now plot the 5 consumption possibilities (combinations of bagels and coffee)... and connect the dots.

Bagels/month  CP1 is represented by a dot at 50 bagels and 0 coffee.

Notice that the slope of the budget line (rise/run) tells us about the opportunity cost of one good in terms of the other.

For example, let's say that we're currently consuming CP1 (50B, 0C), and we decide that next month we want to switch to CP3 (25B, 50C)

➢ What are we giving up?

➢ What are we gaining?

Therefore, we can say that the opportunity cost of the _____ cups of coffee that we gain is the _____ bagels that we give up.

➢ So, if this is the case, what is the opportunity cost of 1 cup of coffee?
Also notice that points outside the budget line cannot be purchased with available income. For example, the combination of 50 bagels and 50 cups of coffee is beyond our budget. Points exactly on the budget line exactly use up our income (examples are CP1, CP2, CP3, CP4, and CP5), and points inside the budget line can be purchased but leave some income left over (for example 25 bagels and 20 cups of coffee).

Summary of important points:
✪ A budget line represents all combinations of 2 goods that can be purchased with available income.
✪ Points exactly on the budget line exactly use up our income.
✪ Points outside the budget line are beyond the budget and therefore cannot be purchased with available income.
✪ Points inside the budget line can be purchased but leave some income left over.
✪ The slope of the budget line tells us about opportunity cost, because as we move down the budget line we're gaining one good and giving up another.
✪ The slope of the budget line tells us how we can trade off one good for another and remain within our budget.
✪ Notice that since we have a constant slope, the opportunity cost is constant.

More practice with budget lines:
Draw the Heather’s budget line for camping trips and ski trips assuming the following:
1. Heather has $2000 to spend on camping trips and ski trips.
2. The price of a ski trip is $200
3. The price of a camping trip is $100

Hint: since budget lines are linear (that is, they have a constant slope) you only need 2 points on the budget line to draw it. The two most obvious points to use are the endpoints – those combinations that use all income on one of the goods and leave none left over for the other good. To find these 2 points, simply ask yourself how many camping trips could Heather have if she spent all of her income on camping trips, and how many ski trips could she have if she spent all of her income on ski trips?

Ski trips per year

| Camping trips per year |

a. Place a dot at a consumption possibility that is beyond Heather’s budget, and label it A.
b. Place a dot at a consumption possibility that leaves some income unspent, and label it B.
c. What is the opportunity cost of one ski trip in terms of camping trips?
d. What is the opportunity cost of one camping trip in terms of ski trips?