**W2 V1 OC**

0:10  
In this video, we're going to take last week's concept, which is opportunity cost.

0:14  
And we're going to adapt it to thinking about production decisions, specifically how to use opportunity cost to figure out how to allocate resources to the production of different goods.

0:26  
OK.

0:26  
So if you're a producer, typically one of the first decisions you have to make is what to produce, right?

0:32  
So you produce T-shirts, you produce tables.

0:34  
What are you going to produce?

0:35  
Most people start off by focusing on what they're going to get for their goods when they sell them.

0:41  
Remember, the other side of this equation is what it costs you to produce system.

0:44  
For economists, all costs are opportunity cost.

0:49  
So we are going to think about costs in our framework as opportunity costs, and for that, what do we need?

0:54  
I need to know what resources I'm going to use, and I'm going to need to know the next best alternative use of my resource.

1:01  
This can be a really complicated problem, so let's make it simple by making a bunch of admittedly crazy assumptions, but they really help us narrow down the focus to the main channels and the main insight that we have.

1:13  
OK, So what are we going to assume?

1:15  
The first thing we're going to have to take a stand on is what are the resources that we use?

1:18  
Let's keep it really simple and let's just think about the simplest possible resource, which is time.

1:24  
OK, so I'm doing this so that we can focus on implicit costs, which is something that's typically not, we're not familiar with.

1:31  
So time, everyone has a limited amount of time.

1:34  
In this case, I'm going to make it just 10 hours a day.

1:37  
And what we've got to figure out is how to allocate this time to produce two goods, Two goods.

1:43  
By choosing 2, I'm narrowing it down to one option and the next best alternative.

1:48  
OK, you can make this more complicated.

1:50  
This is the simplest possible version.

1:51  
So you can either become a Carpenter and produce tables, or you can become a chef and produce meals.

1:57  
What I do need to know is how productive you are at each one of these options.

2:02  
So given the resource that you have, which is time, in one hour of time you have two people.

2:09  
In this example here I've got an who can produce 3 tables with one hour or three meals and then the other person in here.

2:17  
Because remember to allocate production I need 2 goods, but I also need two people.

2:21  
If I'm thinking about a more fuller scenario.

2:25  
And the other person here is Bill.

2:26  
Bill is going to, with his one hour, produce either one table or two meals.

2:32  
OK, with that, let's get started on figuring out what the cost of production is.

2:36  
Remember, all costs for us are opportunity cost of production.

2:40  
So if Anne wants to figure out the cost of production of one table, what she's got to figure out is how many meals she needs to give up.

2:52  
Why?

2:52  
Because to produce one extra table, she's got to take resources, which is time away from meal production in order to produce the extra table.

3:01  
Now, right now, we're given that with one hour of her time, she produces 3 tables or three meals.

3:10  
OK, so that's giving us a baseline to start off with.

3:13  
If I want one table, which is what an opportunity cost is typically framed as one extra unit, then how many hours does she need?

3:21  
If she produces 3 tables in one hour, then she's going to need 1/3 of an hour in order to produce one extra table.

3:30  
If she pulls out 1/3 of an hour from meal production, how many meals is she giving up?

3:36  
Well, if she's producing 3 meals in one hour, then in 1/3 of an hour she's giving up 1/3 \* 3, which is 1 meal.

3:52  
OK, so that's kind of the economic intuition of how we calculate the opportunity cost for N, which is 1.

4:00  
Sorry, one meal.

4:08  
OK, let's be a little bit careful here.

4:11  
Opportunity cost is always denoted in units of the good because she's not just giving up one arbitrary thing, she's giving up one meal because it's the resources that were taken away could have produced one meal.

4:23  
In this example here I'm going to show you another more mathematical way of doing this.

4:27  
And some of you this may be simpler, but I would strongly encourage you to focus on the on the intuition.

4:33  
So here's another way of coming to exactly the same number and we'll use that for Bill.

4:38  
OK, so Bill can produce either one table in one hour or two meals in one hour.

4:50  
OK, now for Bill, if I want one meal, OK, in that sense what I'm solving for Bill here is the opportunity cost of Bill for one for meal, right?

5:03  
So one extra meal instead of focusing on how many hours, which will be an economic intuition because it's literally do the math in here where you've got this information and you've got to figure out using this information what the value in this is here, right?

5:17  
And you know from your intro math this is just 1 \* 1 / 2, which is 0.5.

5:24  
And the danger we're doing this method is that you typically just write 0.5 in here, and what you forget is to add in the fact that when I'm taking away resources away from table production, I'm giving up the production of tables.

5:41  
OK, so if you are going to use the map, that's fine, just don't forget about the units in there.

5:46  
OK.

5:47  
So Bill and that's how we calculated.

5:50  
Now notice what we can also do here is either calculate bills opportunity cost of a table directly or notice the relationship between the opportunity cost of a table and the opportunity cost of a meal.

6:04  
If I do the same calculation for Bill, I'm sticking with Bill here.

6:08  
So I'm looking at this thing here.

6:10  
Bill can produce three, sorry 2.

6:15  
Oops.

6:20  
OK, table meals.

6:25  
He can produce one table and two meals.

6:33  
If I want the opportunity cost of a table, I'm looking for one table here and I'm asking what this is.

6:46  
Now this is a little bit tricky because of the numbers that I've chosen.

6:48  
They cancel out easily.

6:50  
However, if we follow the math example, you're basically going to be doing 1 \* 2 / 1.

6:58  
Notice that this is just the inverse of what we did in the previous one, right?

7:04  
So this is going to be two meals.

7:07  
Don't forget the units.

7:09  
But it is also the inverse of each other.

7:12  
So the opportunity cost of a table is one over the opportunity cost of a meal.

7:20  
When I have really nice linear, constant productivities like this, just pay attention to this.

7:26  
Again, don't worry about the math too much.

7:28  
Focus on the intuition and you'll be golden for the math.

7:31  
OK, that's one way that these things are phrased.

7:34  
It's another way that you can see these calculations is when we phrase it as how much time or how many units of the resource we need in order to produce one unit.

7:47  
Both of these are equivalent.

7:48  
Sometimes it just depends on the data we get.

7:50  
So you need to be comfortable with using both of these.

7:52  
OK, so here we're kind of saying if you want one table, I'm going to tell you you need 1/3 of an hour, and if you want one meal, you're going to need 1/3 of an hour for Anne.

8:02  
And then the same data for Bill.

8:04  
We can do the same logic, except it's going to be an extra step in here.

8:08  
And this is where I always make mistakes.

8:10  
I'm going to show you what works for me.

8:13  
And what works for me is basically taking this and converting it into the previous example.

8:17  
That way I make fewer mistakes, but you find what works for you.

8:21  
Focus on the focusing on the economic intuition.

8:24  
OK, so here's what works for me.

8:25  
What I do here is I kind of start off with an intermediary where I'm taking the information that we have and I'm converting it into the information on the previous slides.

8:37  
So tables, meals.

8:41  
This is going to be for Anne.

8:43  
I'm taking the information that she needs 1/3 of an hour and converting it into what she would need or what she would get in one hour.

8:53  
OK, so if she takes 1/3 of an hour for one table, this means that in one hour she can produce 3 tables.

9:04  
OK, I find this way is the simplest for me and especially when you've got these fractions and you have to do one over.

9:10  
Working this way really minimizes errors in my experience.

9:14  
OK, so then I would follow exactly the same thing that we did before.

9:18  
In one hour she gets 3 tables, 1/3 of an hour, which means in one hour she gets three meals right?

9:28  
And then we just literally follow the same procedure that we did before.

9:32  
If I want her opportunity cost for one meal, then I'm basically going to be asking what this number is and it's going to be 1 \* 3 / 3 which is 1.

9:45  
Don't forget the magic table at the end.

9:48  
And here I would fill in one table.

9:52  
Notice you're going to get exactly the same number as you got in the previous way.

9:56  
How the data is given to you doesn't change the opportunity cost.

9:59  
Just some calculations are easier than others for some people.

10:02  
Whichever way works for you, do it.

10:04  
Focus on the economic intuition.

10:05  
Please don't memorize formulas.

10:07  
Easiest way to get stuff wrong on a multiple choice.

10:10  
OK, now what do we do with calculating this cost of production?

10:16  
Effectively, what we were doing is calculating what we call trade-offs.

10:21  
OK, if I want more of something, what am I giving up?

10:25  
If I want to produce one more table, how many meals am I giving up right?

10:33  
Because I have to pull these scarce resources out of the production of the other good into table production, flip it around for the opportunity cost for meals.

10:43  
If I want one extra meal, how many units of tables do I need to give up, right?

10:49  
Remember these two important things with students always forget.

10:52  
One is that you are expressing trade-offs in units of the good.

10:57  
An opportunity cost of 1 means nothing without the context that it is one table.

11:02  
You always need to have those units in there, OK, Please pay attention to that.

11:06  
If you don't give us the units on an exam, you're not going to get the points because it's an important concept.

11:12  
The other thing that we want to be careful about is we are implicitly assuming that Ann and Bill are using all of their time in the most productive way we've all been.

11:22  
In that scenario where you've got time, you could be doing plenty of things with that time.

11:27  
We don't really do it to fullest, you know, Use your time to the best advantage, OK, we are not in that situation here.

11:34  
We're saying we've got 10 hours.

11:35  
These guys are working at the maximum capacity.

11:37  
They're not wasting any time.

11:39  
If I have time to spare, then I'm not giving up anything in order to produce an extra table.

11:44  
I have spare time lying around.

11:46  
So the opportunity cost of an extra table in that case is 0, because I have time that I'm doing literally nothing with no alternative use.

11:54  
It's only when I'm using all of my resource, I'm using everything productively.

11:59  
And now you asked me to give you more, then I'm gonna start pulling stuff away and that's when we have a positive opportunity cost always expressed in units of the good.