GENERAL INSTRUCTIONS *(MS Word version of online instructions)*

You are about to participate in a decision-making experiment, and at the end of the session you will be paid in cash for your participation. Different participants may earn different amounts. What you earn will depend on your decisions, as well as the decisions of others.

In this experiment you will participate in a computer-assisted market. You will participate in this market through the computer terminals at which you are seated. The interaction among participants will take place primarily through these computers. It is important that you do not talk or in any way communicate with other participants during this experiment. If you disobey the rules, we will have to ask you to leave the experiment.

We will start with a detailed instruction period. During the instruction period, you will be given a complete description of the experiment and shown how to use the software.

If you have any questions while going through the instructions, please raise your hand. If any difficulties arise after the experiment has begun, raise your hand, and a monitor will come and assist you.

We will begin with a brief overview of the instructions, and then provide more details on how to enter your decisions into the computer.

In today's experiment, you are one of eight participants. This is an experiment in which you can produce units of a fictitious good. For each unit you choose to produce, you will earn a particular amount of cash. In order to produce a unit without potentially facing a penalty, you need a permit for each unit you produce. You can produce as many units as you want regardless of the number of permits you own, but you could face a financial penalty if you do not own a permit for each unit you produce.

The experiment is divided into a series of five-minute periods. At the beginning of each period, you will receive a starting amount of permits and an initial cash balance. During the period you will have the opportunity to (1) produce units of the fictitious commodity, and (2) buy or sell permits in a permit market.

During the period, you can earn money in two ways:

1. Produce units of the fictitious good. For each unit you produce, you will earn a specified amount of money that will be added to your cash balance.
2. Sell permits in the permit market. The selling price you receive for a permit will be added to your cash balance.

Money will be subtracted from your cash balance if:

1. You choose to buy additional permits. The purchase price you pay will be deducted from your cash balance.
2. You are audited and if the total number of units you produce exceeds the number of permits you own. You will be told of the likelihood of an audit. For example, there might be a 35% chance that you will be audited at the end of the period and a 65% chance you will not be audited

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To summarize, your total earnings for the period will be calculated as follows:

	Your initial cash balance
+	Earnings from production of the good
+	Selling price for permits you sell in the permit market
–	Purchase price for permits you buy in the permit market
–	Penalties for a permit shortfall (only if you are audited and if you over produced)
=	Total earnings for the period

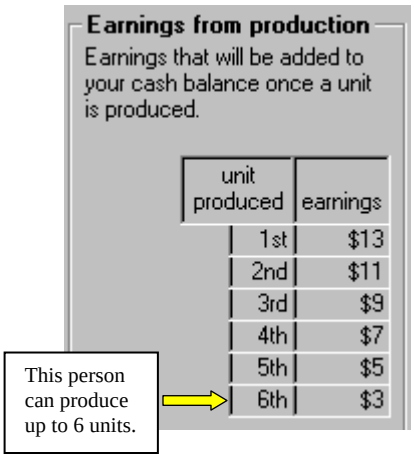
At the end of the experiment, we will add up your total earnings for each period and you will be paid in cash for these earnings.

In this experiment, you will earn "experimental dollars," denoted E$. For every <*insert exchange rate*> experimental dollars you earn, you will be paid US$1 at the end of the experiment.

Now let's look at how to enter your decisions into the computer.

During each period, you will have the opportunity to produce units of a fictitious commodity. Each unit you produce will automatically be "redeemed" for cash earnings. You may think of this as "selling" the units you produce to the experimenter. This "selling" will be done automatically as soon as production of each unit is completed. We will refer to these cash earnings as your "earnings from production."

On the right is a purely HYPOTHETICAL example of your "earnings from production." In this example, you may choose to produce up to 6 units. You can see this by looking at the bottom of the table noticing that the last value listed is the 6th unit produced.



Say you decide to produce a total of 3 units. You will receive E$13 for the first unit produced, plus E$11 for the second unit, plus E$9 for the third unit. The total earnings for producing all 3 units will be E$33 (=13+11+9).

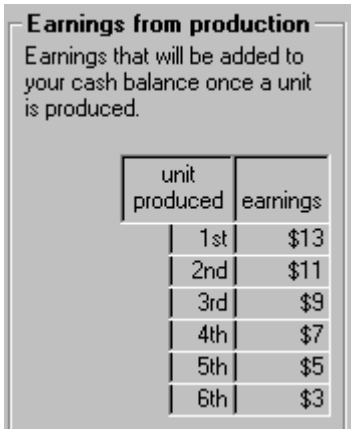
If you decide to produce a fourth unit, you will receive an additional E$7, for a total of E$40.

Note that you may receive a different amount of money for each unit produced.

Remember that these values are HYPOTHETICAL and may not look at all like the values you will see during the experiment.

These redemption values may be different for each person in the experiment, so do not assume that everyone has the same values as you.

Say you have already produced 4 units. How much additional money would you earn if you choose to produce a 5th unit? *<answer=$5>*

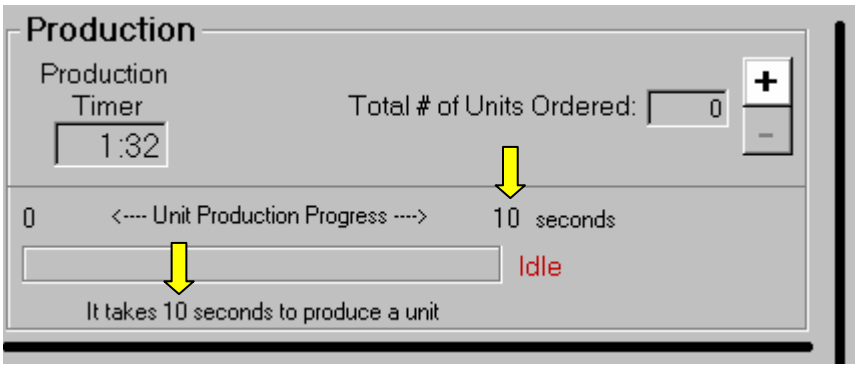


If right…Correct. You would earn an additional E$5 if you produced a 5th unit. (point arrow to the $5 in the table).

If wrong…Incorrect. You would earn an additional E$5 if you produced a 5th unit as shown by the arrow. Please enter $5 now. (point arrow to the $5 in the table).

Now that we've shown you how to calculate how much money you earn from production, let's look at how you can produce these units using a HYPOTHETICAL example.

On your computer screen, you will see a section labeled "Production." Use this section to manage production of the good.



You can only produce one unit at a time. In this HYPOTHETICAL example, it takes 10 seconds to produce each unit. You can see this in two places, shown above by the yellow arrows.

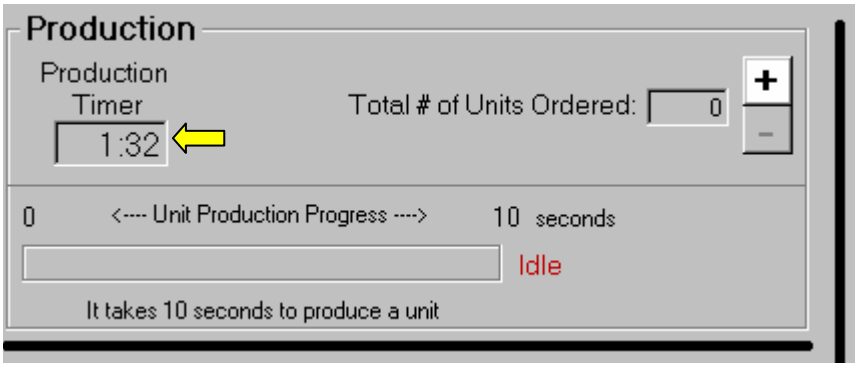
In this example, how many total seconds will it take to produce 3 units? <*answer=30 seconds*>

If correct…Correct. It takes 10 seconds to produce each unit, so it will take 30 seconds to produce 3 units. There needs to be enough time on the production timer for you to complete production of these units.

If incorrect…Incorrect. It takes 10 seconds to produce each unit, so it will take 30 seconds to produce 3 units. Please enter 30 seconds now.

Now, the production timer shows that there is 1:32 production time remaining, so there is still plenty of time to complete production of 3 units.

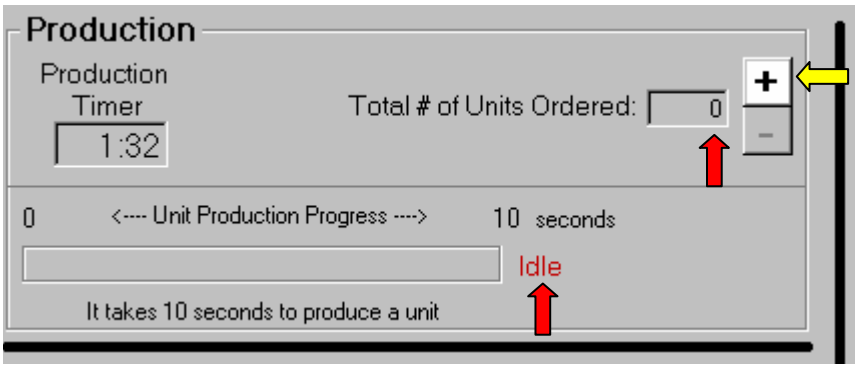
When the period begins, you will have enough time to produce your maximum number of units, but be sure to keep an eye on this clock. Eventually production time will run out and you will no longer be able to produce units.



If there are 28 seconds remaining in on the production timer, how many more units will you be able to produce? <*answer*=2> With 28 seconds, you will have time to complete the production of 2 units. Since there is not enough time to complete production of the 3rd unit, the computer will not allow you to increase your order by more than 2 units.

When the period begins, production is "idle" and the total number of units ordered to be produced is zero. This is shown by the red arrows.

To begin production, click on the plus (+) button, shown by the yellow arrow. The "Total Number of Units Ordered" will increase by one each time you click on the plus (+) button and production will start immediately.



Now, click on the plus (+) button once to start production of the first unit. (*give them a few seconds, then flash a warning with an arrow pointing to the +*).

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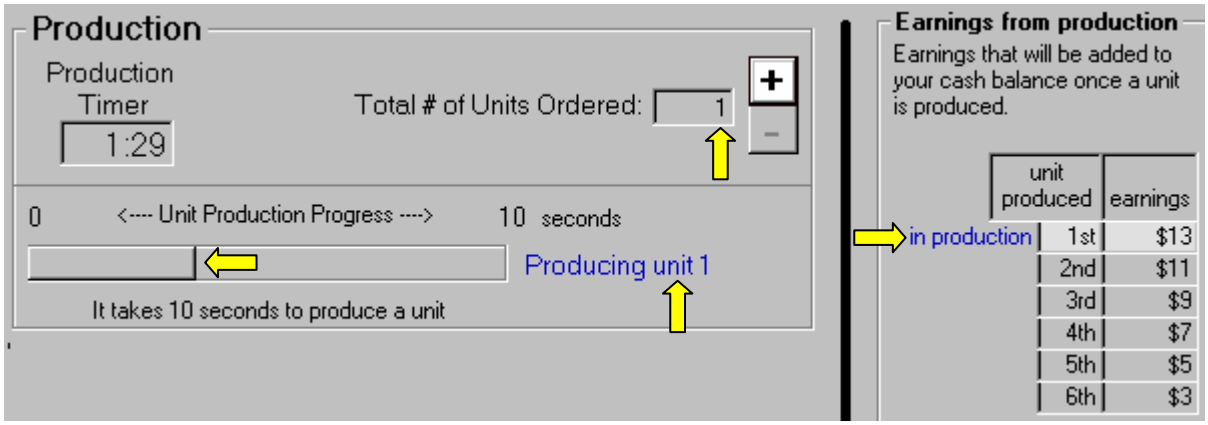
after they click +…



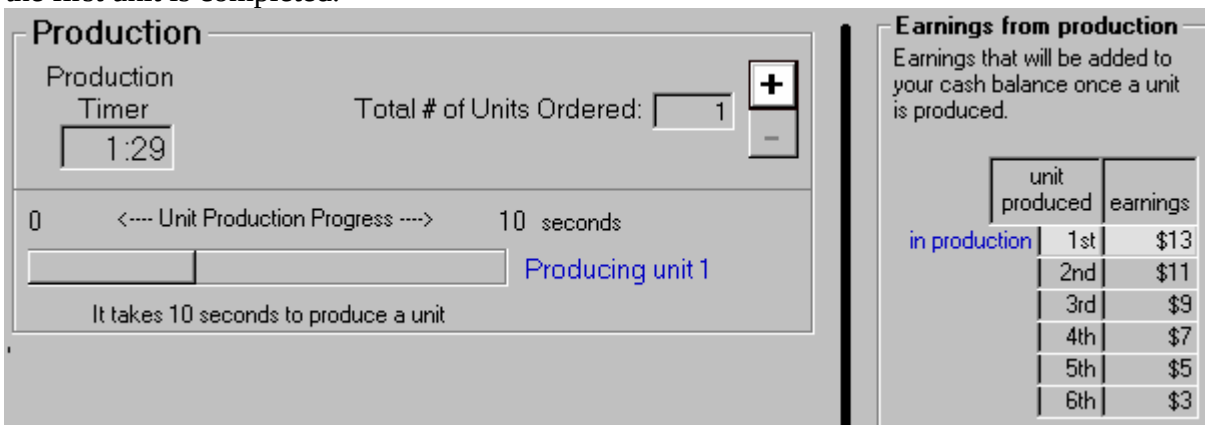
Notice that the total number of units increases to one and the bar under "Unit Production Progress" begins to move. *(just show a static bar about 1/3 way. Make sure that timer is consistent and shows 3 seconds used up)*. (note, in actual instructions, the production bar has not moved forward. It is shown exactly as it is above)

In this example, the first unit has been in production for 3 seconds. Since each unit takes 10 seconds, the "Unit Production Progress" bar shows production about 1/3 completed.

To the right of the progress bar the computer tells you that you are currently "Producing unit 1."

On the far right of the screen, under the "Earnings from production" table, you can also see that the 1st unit is currently in production. Once production of this unit is finished, E$13 will automatically be added to your cash balance.

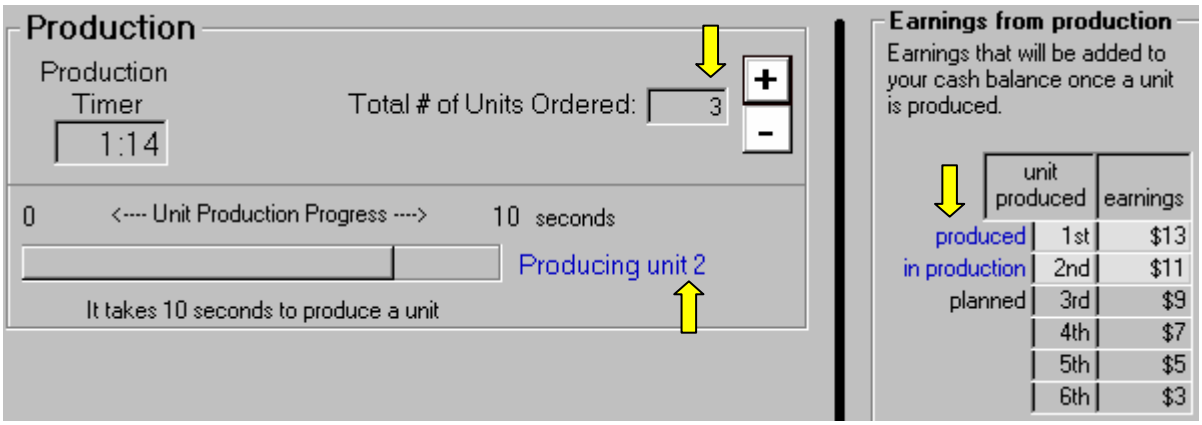
Say that while the 1st unit is still in production, you decide that you want to produce a total of 3 units. You can place an order for these additional units at any time, you do not have to wait unit the first unit is completed.



Increase the "Total Number of Units Ordered" from 1 to 3 by clicking on the plus (+) button. Please do this now. *(wait a few seconds, then flash an arrow). Once they get to 3, then move on…*

Once three units are ordered, it shows: “Correct. Notice that 3 units are on order and the second and third units are ‘planned’.”

After production of a unit is completed, production of the next unit ordered will automatically begin. In the example below, to the right of the “Unit Production Progress” you can see that you are now “Producing unit 2”. Since you have a total of 3 units ordered, once the 2nd unit is completed, production of unit 3 will automatically begin.



You can also view the production status of each unit by looking under the “earnings from production” table. In this example, you see that:

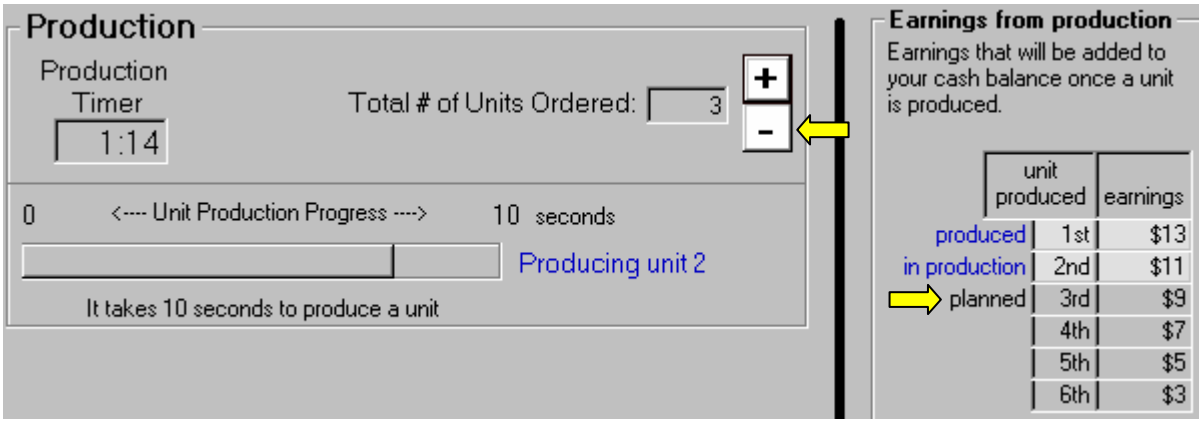
- The 1st unit is already “produced,”
- The 2nd unit is “in production,”
- The 3rd unit is “planned.”

There is nothing next to the 4th, 5th and 6th units, because you only have 3 units ordered.

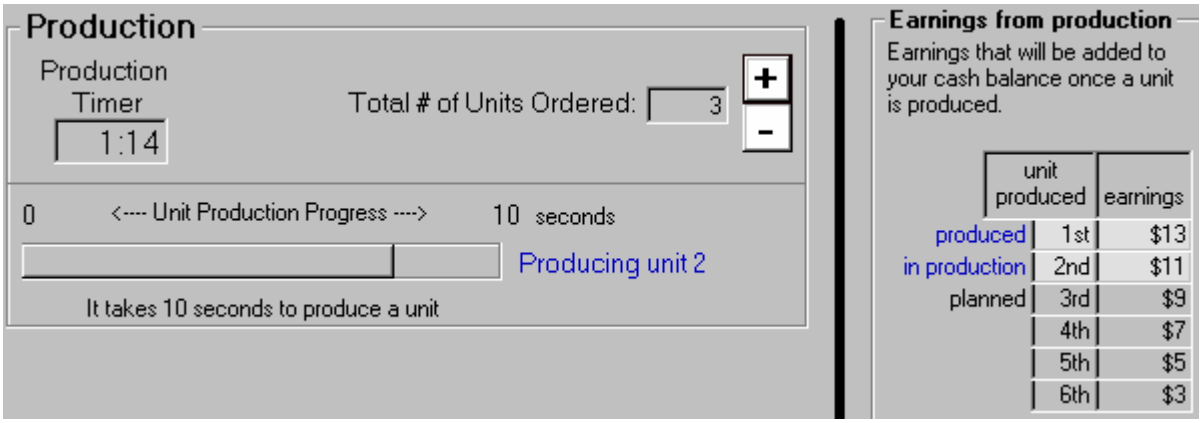
If a unit has already been produced, or if a unit is currently in production, you cannot cancel production. However, you may cancel orders for any units that still show as "planned."

In the example below, the 3rd unit is planned. Say you decide you only want to produce 2 units, instead of 3. Since production of the 3rd unit has not yet begun, you can cancel the order by clicking on the minus (–) sign and changing the "Total Units Ordered" to 2.

Do that now. Click on the minus (–) button and change the Total Number of Units Ordered to 2. *<give a few seconds, then flash>*



Production Summary



We have just gone over everything you need to know about how you can produce units of the good. To summarize:

- The "Earnings from Production" table tells you how much you will earn for each unit you produce.
- Production of each unit takes a specified amount of time
- You can only produce one unit at a time.
- In order to start production of a unit, there must be sufficient time on the Production Timer to COMPLETE production of the unit.
- Earnings from production are automatically added to your cash balance as soon as production for that unit is complete.
- The Production Timer tells you how much time is left for you to produce more units.
- The last row of the "Earnings from Production" table tells you the maximum number of units you are able to produce.
- To start production or to place an order for additional units, click the plus (+) button. If production is idle, then production will begin immediately.
- You can cancel units that have been ordered if production has not yet begun for those units. To do so, click the minus (–) button.
- Under the "Earnings from Production" table, you can see the production status of each unit (produced, in production, or planned).

Remember that in order to avoid the possibility of a financial penalty, you need a permit for each unit that you produce. At the start of each period, you will be given some permits and an initial cash balance. You can see this in the 'My Balances' section of your screen:

In this HYPOTHETICAL example, you start the round with E$22 in cash and 3 permits. If production has not yet started, the "units produced or in production" will be zero. The three boxes in the My Balances section will be updated throughout the period depending upon what you choose to do.

You may decide that you want to sell some of these permits, or you may want to purchase additional permits. During the period, in addition to being able to produce units of the good, you will also be able to trade in the Permit Market.

You cannot sell more permits than you own. In this example, unless you buy more permits, you cannot sell more than 3 permits.

We will now describe the Permit Market in which you can buy and sell permits.

In the Permit Market, you can do four things:

1. Make a bid to buy a permit,
2. Make an offer to sell a permit,
3. Purchase a permit at the Current Selling Price,
4. Sell a permit at the Current Buying Price.

We will now show you how to do each of these.

Suppose that after the period begins, you decide that you want to sell one of your permits for $17.

To enter your offer to sell, type 17 in the box next to 'My Selling Price,' and then click 'Sell'.
Please do this now.

If correct, move on. If incorrect, point to the selling price box and tell them to enter in $17.

Notice that your selling price of $17 is now the Current Selling Price for the entire market. This information is displayed in a similar manner for everyone in the experiment.

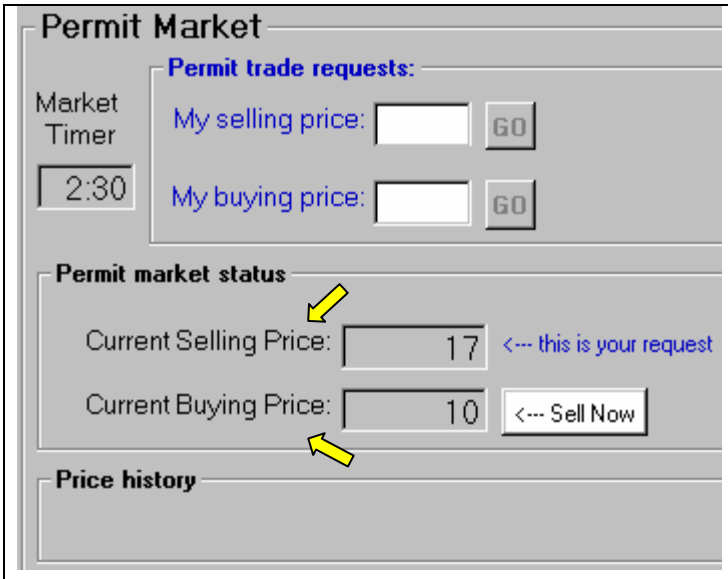
Whenever your price is the current price, the computer will point out that "this is your request," as shown in this example.

Suppose that upon seeing your offer to sell a permit for $17, someone else in the market decides to respond to your offer by offering to buy a unit for $10.

(Offers to buy are entered similar to offers to sell. To do this, you would enter the amount next to "my buying price" and click Go).

This buyer's offer to pay $10 is now displayed to the entire market next to Current Buying Price.

(add "Sell Now?" button next to Current Buying Price.)



At any point in time, only the LOWEST OFFER to sell and the HIGHEST BID to buy will be standing in the market. These are the Current Selling Price and Current Buying Price, shown by the arrows.

Any bid to buy must be HIGHER than the Current Buying Price, and any offer to sell must be LOWER than the Current Selling Price.

Another way of thinking about this is that any new price either to buy or sell, must be BETWEEN these amounts. In this example, My Selling Price or My Buying Price must be between 10 and 17.

(add "Sell Now?" button next to Current Buying Price.)

Given the Current Selling Price and Current Buying Price shown, any BID to buy that is GREATER than $10 will become the new Current Buying Price.

Any new OFFER to sell that is LOWER than $17 will become the new Current Selling Price.

Depending upon number of decimals allowed…
All prices must be in whole dollar amounts (no cents).
or…
Prices can be entered in dollars and cents.

Suppose you decide that you are willing to accept the buyer's offer of $10 for one permit. To sell your permit for this price, click the 'Sell Now' button.

Please do this now.

Once the trade goes through, you will get a message telling you that "You sold 1 permit for $10." This $10 will be added to your cash balance, and 1 permit will be deducted from your permit balance.

The price history shows you every trading price in the market. If you were the trader for one of the prices, in parenthesis you will see an (S) if you are the seller and (B) if you are the buyer. In this example, you sold a permit for $10, so the price history shows $10(S).

After a trade occurs, the Current Selling Price and Current Buying Price are reset and the bidding process begins again.

Since there are no trade requests 'on the table,' you can enter any price in the allowable range (for example, no less than $0.02, and no more than $20.00).

The Market Timer tells you how much time is remaining in the Permit Market. Typically, the Permit Market will remain open for a short while after the Production Timer has ended.

Permit Market Summary

We have now shown you how to trade in the market. To summarize, in the market you can do four things:

1. Make an offer to buy a permit.
    a. To do so, enter your price next to the My Buying Price and click Buy.
    b. All buying prices must be GREATER than the Current Buying Price.
2. Make an offer to sell a permit.
    a. To do so, enter your price next to the My Selling Price and click Sell.
    b. All selling prices must be LOWER than the Current Selling Price
3. Purchase a permit at the Current Selling Price.
    a. To do so, click the 'Buy Now' button.
4. Sell a permit at the Current Buying Price
    a. To do so, click the ‘Sell Now’ button.

After each trade is completed, your permit balance will be automatically updated. Your cash balance will automatically be updated to reflect the price you paid to buy the permit, or the price you received for selling the permit. This is shown in the My Balances section of your screen.

After the period has ended, we will proceed to the auditing stage.

The computer monitor always knows how many permits you own but does not know how many units you produced, unless you are audited.

There is a XX% chance that you will be audited.
If you are audited, the computer will compare the number of units you produced to the number of permits you own. To avoid a financial penalty, you need a permit for each unit you produced. There are two possible outcomes of the audit:

1. If you produced more units than the number of permits you own, then you will incur a financial penalty for the permit shortfall. This penalty will be described shortly.
2. If the number of permits you own is greater than or equal to the number of units you produced, then you have a permit for each unit produced and you will not incur a penalty.

There is a (1-XX)% chance that you will not be audited.
If you are not audited, you will not incur any penalties, regardless of the number of permits you own or the number of units you produced.

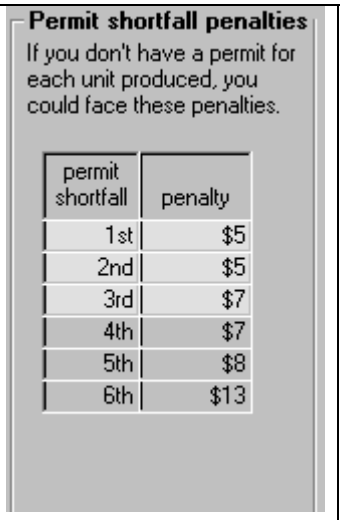
At the end of the period, if you produced more units than the number of permits you own you have a permit shortfall. The Permit Shortfall Penalties table shows you the financial penalty you will incur for each unit shortfall, if you are audited.

Say you produced 5 units, but only own 2 permits. Your permit shortfall is 3 units. If you are audited, you will be penalized $5 for the 1st unit permit shortfall, $5 for the second unit permit shortfall, and $7 for the 3rd unit permit shortfall.

Therefore, your total penalty for a 3 unit permit shortfall is $17 (=$5 + $5 + $7).

Notice that the 1st, 2nd and 3rd lines are highlighted to show you the permit shortfall and the potential penalty you face given the units that you have already produced or have in production.

If you are not audited, you will not incur a permit shortfall penalty.



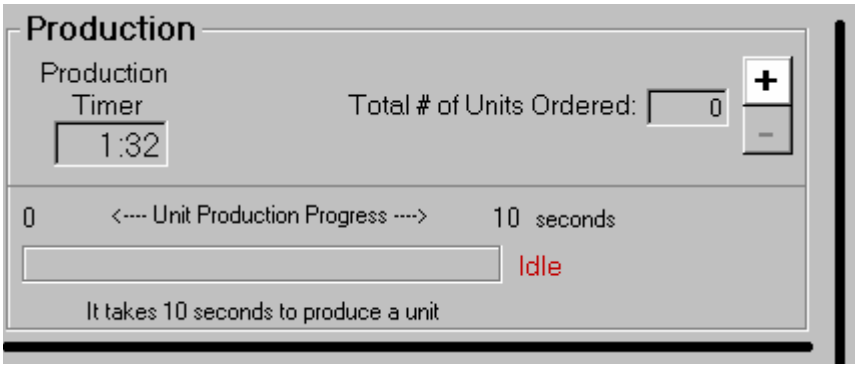
After the auditing stage has completed, you will receive a summary of your earnings for the period. An example of the accounting is shown to the right:

<<INSERT IMAGE HERE>>

Before we proceed, we are going to ask you a few questions to make sure you understand the instructions.

1) Do you need to own a permit in order to produce a unit?
(No. You do not need to own a permit to produce a unit. However, at the end of the period, if you are audited and do not own a permit for each unit produced, you will incur a financial penalty.)

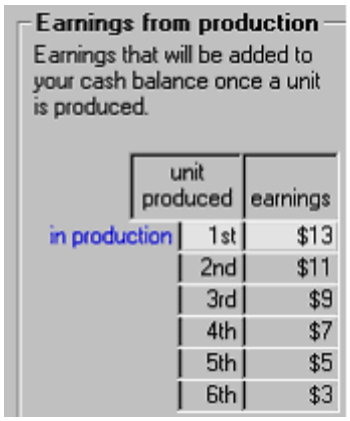
2) In this example what is the greatest number of units you can produce in the amount of time shown on the Production Timer. (9. It will take 90 seconds, or 1 minute and 30 seconds to produce 9 units. After the 9 units are produced, there will be 2 seconds remaining. Since there is not enough time to complete production, you will not be able to start producing a 10th unit.)



3) Can you stop the production process for a unit that is in production? (No, once production has started it cannot be stopped. However, you may cancel orders for units that are planned but have not yet started production.)

4) Look at the table below. How much will you earn for the third unit produced? If you produce the 3rd unit, you will earn an additional $9.

How much will you earn, in total, for producing 3 units? If you produce 3 units, earn a total of $33.



5) Say you have a permit you want to sell. As shown below, the Current Selling Price in the market is $40. Does the selling price you choose to submit have to be more than $40 or less than $40 in order for your selling price to be valid?

(LESS. All new selling prices must be below the Current Selling Price, which is $40 in this example.)

6) Consider the table below. Say at the end of the period you produced 8 units and own 3 permits. If you are audited, how much will you be fined in total? ($32. You have a 5 permit shortfall. The total penalty can be found by adding the individual penalties for each permit shortfall. In this example, the total penalty $32 = $5 + $5 + $7 + $7 + $8)

Permit shortfall penalties

If you don't have a permit for each unit produced, you could face these penalties.

permit shortfall	penalty
1st	$5
2nd	$5
3rd	$7
4th	$7
5th	$8
6th	$13

EXPERIMENT SUMMARY

We have just reviewed all of the components of the experiment. The purpose of the experiment is to give you an opportunity to earn as much money as possible. You can earn money by producing units of a good and/or trading in a permit market. You can produce as many units as you want regardless of the number of permits you own, but you could face a financial penalty if you do not own a permit for each unit you produce.

Production Highlights

- Your Earnings from Production table tells you how many units you can produce and how much you will earn from each unit you produce. You might earn a different amount of money for each unit produced.
- Production of each unit takes a specified amount of time (10 seconds in the example above).
- You can only produce one unit at a time.
- To start production or to place an order for additional units, click the plus (+) button. If production is idle, then production will begin immediately.
- You can cancel units that have been ordered if production has not yet begun. To do so, click the minus (–) button.
- Earnings from the units produced are automatically added to your cash balance when production is completed.

Permit Market Highlights

- You will be given an opportunity to buy and/or sell permits in the Permit Market.
- There are 4 ways in which you can participate in the market:
    - Submit an offer to buy a permit. You will buy a permit if someone else agrees to sell the permit to you at the price you submit.
    - Submit an offer to sell a permit. You will sell a permit if someone else agrees to buy the permit from you at the price you submit.
    - Buy a permit by accepting someone else's offer to sell it. You will buy a permit at the Current Selling Price shown on your screen.
    - Sell a permit by accepting someone else's offer to buy it. You will sell a permit at the Current Buying Price shown on your screen.
- Any time you submit an offer to buy or sell a permit, the price you submit must be between the Current Selling Price and the Current Buying Price.

Auditing Highlights

- The computer monitor always knows how many permits you own and you cash balance. The computer does not know how many units you actually produced unless you are audited.
- There is an XX% chance that you will be audited, and (1-XX)% chance you will not be audited.
- If you are audited, the computer monitor will check to see how many units you actually produced. If the number of units you produced exceeds the number of permits you own, you will receive a financial penalty. The Permit Shortfall Table lists the penalties you will face.