Growing backyard gardens is a cost-cutting practice.

Growing a backyard garden is a practice all people should adopt.

We can simplify this symbolically if we substitute the following letters for each of the terms: *C* = "cost-cutting practices," *P* = "practices all people should adopt," and *G* = "growing a backyard garden." Here is the symbolic form of this syllogism:

All C is P.

All G is C.

All G is P.

Once we have translated this everyday argument into categorical form and then symbolic form, it is easy to see its mood: It is an *AAA* syllogism. You will notice that the process for determining the mood of an everyday argument is the same for determining the mood of an argument written in categorical form. Now that we have examined mood, let's examine figure.

The second indicator used to determine the schema of a syllogism is its figure. Figure is determined by the location of the middle term, which, as you know, is designated *M* in the categorical syllogism. Look at the two previous examples. Notice that not only do they have different moods, but the position of their middle term is also different.

There are four possible middle term positions:

	Figure 1		**Figure 2**		**Figure 3**		**Figure 4**	
Major Premise	*M*	*P*	*P*	*M*	*M*	*P*	*P*	*M*
Minor Premise	*S*	*M*	*S*	*M*	*M*	*S*	*M*	*S*

In the above chart, you'll notice that we only provide a look at what's going on in the major premise and the minor premise. What we do not include in the chart is the third proposition that's always a part of every syllogism: the conclusion. The conclusion of every syllogism is always ordered such that the minor term sits as the subject, and the major term sits as the predicate. *This is always the case.* As a result, in the syllogism, we assign the letter *S* to the minor term and we assign the letter *P* to the major term.

S = minor term P = major term M = middle term

The major premise always includes the major term (that's how we know it's the major premise). So, in the figure chart, anytime you see a *P*, we're referring to the major term of the syllogism. The minor premise always includes the minor term (that's how we know it's the minor premise). So, anytime you see an *S*, that is the minor term of the syllogism.

The major premise will always include some combination of middle term (*M*) and major term (*P*). And the minor premise will always include some combination of the middle term (*M*) and the minor term (*S*).

To determine the figure of a syllogism, the most important term to watch is the middle term (*M*). *The placement combination of the middle term in the major and minor premises determines the figure of the syllogism.*

In a **Figure 1 syllogism**, the major premise is organized such that the middle term (*M*) sits as the subject. The minor premise is organized such that the middle term (*M*) sits as the predicate of the sentence. In a **Figure 2 syllogism**, both the major and minor premises are organized such that the middle term (*M*) sits as the predicate. In a **Figure 3 syllogism**, both the major and minor premises are organized such that the middle term (*M*) sits as the subject. And finally, in a **Figure 4 syllogism**, the major premise is organized such that the middle term (*M*) sits as the predicate and the minor premise is organized such that the middle term (*M*) sits as the subject.

Now that we have examined figure and understand how the four figures work, let's look back at our syllogisms about presidents and phones. What is the figure of the first syllogism about presidents? In the major premise, the middle term is the subject term. In the minor premise, the middle term is the predicate term. Therefore, the first syllogism is figure 1. The schema of the first syllogism is a combination of its mood and its figure, and it is written this way: *EII-1*. The schema will always be written as the three letters of the syllogism's mood followed by the number representing its figure.

And what about our syllogism about backyard gardens? If you look at it again, you will notice that the middle term—"cost-cutting practices"—is the subject of the first premise and the predicate of the second premise. Therefore, this syllogism is figure 1.

Being able to detect the mood and figure of a syllogism can be extremely helpful for several reasons. One reason is that it is good to be able to assign a name to different types of syllogisms. Another reason mood and figure can be helpful is because they can help you to figure out whether or not a syllogism is structured correctly. To illustrate this better, we want to introduce you to a clever memory device that people in the Middle Ages devised to use mood and figure in order to identify correctly structured syllogisms. Before we introduce this device, we want to introduce two terms that we will discuss more thoroughly in the next chapter: valid and invalid. We use the term "valid" to describe a syllogism that is structured correctly. That is, a valid syllogism is one that is logical, or one that works. On the other hand, an invalid syllogism is a syllogism that is not structured correctly. That is, it is illogical, and it does not work properly.

Logicians in the Middle Ages wanted a way to remember all of the valid combinations of mood and figure, so they developed a memory device (a **mnemonic**) to help them do this. It looks really alien and incomprehensible at first, but soon you will understand how it works. Here it is:

Barbara, Celarent, Darii, Ferio *que prioris*

Cesare, Camestres, Festino, Baroco *secundae*;

Tertia, Darapti, Disamis, Datisi, Felapton,

Bocardo, Ferison, *habet*; *Quarta in super addit*

Bramantip, Camenes, Dimaris, Fesapo, Fresison[2]

Now, don't be scared. It's not as mysterious as it seems. This is how it works:

The first line of the memory device represents the first figure. Remember, that is the figure in which the middle term is the subject of the first premise and the predicate of the second. In fact, each of the different lines in the memory device represents a different figure (the first line is the first figure, the second line is the second figure, etc.). We have figure, but what about mood? After all, with syllogisms, figure is only one half of the equation. Here's where those medieval logicians got really clever. All of the vowels of the names in the first line are the moods valid in the first figure. That is, the three *A*'s in "Barbara" stand for the mood *AAA*. The *EAE* in "Celarent" stand for the mood *EAE*. The *AII* in "Darii" stand for the mood *AII,* and so on. The words *que* and *prioris* are Latin for "and" and "first," as in "first figure." Therefore, here are all the valid moods in first figure: *AAA*, *EAE*, *AII*, *EIO*. You will note that these vowels match exactly the vowels in the names in the first line.

The valid moods in the second figure are represented by the second line of the mnemonic. The word *secundae* at the end of the second line is Latin for "second," as in "second figure." Remember that the second figure is the figure in which the middle term is the predicate of both the first and second premises. Now let's look at mood. The vowels in "Cesare" stand for the mood *EAE*. The vowels in "Camestres" stand for the mood *AEE*. The vowels in "Festino" stand for the mood *EIO*. You get the idea. Here are all of the valid moods in second figure: *EAE*, *AEE*, *EIO*, *AOO*. You will note that these vowels match exactly the vowels in the names in the second line.

By now, you are probably getting the hang of this, so it is not going to surprise you when we tell you that the valid moods in the third figure are represented by the third line and a little into the fourth line of the mnemonic, up to the word *habet*. By the way, the word *tertia* at the beginning of the third line means "third" in Latin, as in "third figure." Don't confuse it with a name. The third line starts with the name "Darapti." Here are the valid moods in the third figure: *AAI*, *IAI*, *AII*, *EAO*, *OAO*, *EIO.*

The valid moods in the fourth figure are found in the last line of the mnemonic. The phrase *Quarta in super addit* means "the fourth," as in "fourth figure," "in addition adds." These are the valid moods in the fourth figure: *AAI*, *AEE*, *IAI*, *EAO*, *EIO*.

You have to admit that it's ingenious, if not also a bit crazy. Now, to be honest, very few logic students memorize this entire mnemonic device today. However, it may be helpful to some of you. Its usefulness lies in the fact that once you have it memorized, you can immediately spot an invalid syllogism because you can compare its mood and figure to the list of valid moods and figures you have memorized. Furthermore, if you want to write a syllogism, you can immediately choose from the available syllogism schemas listed in the device, and you will always know when you have chosen a valid syllogism.

However, some people find this memory device extremely difficult to memorize, so let us clue you in on something

that may make it more reasonable for you. The first line of the memory device contains some of the most common syllogisms you will encounter, especially the first two schemas—*AAA* and *EAE*. For instance, you might have recognized that the first mood and figure—*AAA-1*—is the mood and figure for the famous "Socrates is mortal" syllogism. The point is that if you memorize just this first line, you will know the mood and figure for the syllogisms you will encounter most frequently. Therefore, if you are analyzing a syllogism that has one of these schemas, which is likely, you will automatically know that it is valid. Furthermore, if you are making an argument and want to construct a valid syllogism, you will automatically have five valid schemas from which to choose. What if even memorizing the first line is difficult because the names are so odd? Even memorizing the first two syllogism schemas—Barbara and Celarent—can be of great help. In fact, medieval logicians developed a way to use the relationships of equivalence to convert any syllogism to these first two syllogisms. We won't include that process here, but it does demonstrate how helpful it is to know those first two schemas.

Some people find that, while memorizing this entire device can be daunting, memorizing part of it is helpful, especially for constructing syllogisms. To be honest, there are much easier ways to analyze a syllogism's validity, and you will be introduced to these in the next few lessons. After you have learned all of these techniques, you will notice that some help you construct syllogisms easily, while others help you analyze syllogisms easily. Keeping several techniques in mind will make the world of syllogisms easier and more accessible for you.

Review

Define

1. Mood:

The mood of a syllogism refers to the combination and order of categorical propositions.

2. Figure:

The figure is the location of the middle term in the premises of a syllogism. There are four possible combinations of middle term positions. In the first figure, the middle term is the subject of the first premise and the predicate of the second premise. In the second figure, the middle term is the predicate of both the first and second premises. In the third figure, the middle term is the subject of both the first and second premises. In the fourth figure, the middle term is the predicate of the first premise and the subject of the second premise.

3. Schema:

The schema is a particular syllogism's pattern of organization determined by its mood and figure. It will always be written as the three letters of the syllogism's mood followed by the number representing its figure.