

CHAPTER 4—MEASURING

"Who has measured the waters and the hollows of his hand with the breadth of his hand, marked off the heaven? Who has held the dust of the earth in a basket or weighed the mountains on the scales and the hills in a balance." Isaiah 40: 12.

Ever since the beginning, man has been trying to measure the world around him. That has not always been easy as he has not always had a ruler as we know it today.

The big question is "How do we measure up?" The only answer is, not very well at all. Our ruler for measuring up is our Lord and Savior, Jesus Christ. He kept the law perfectly for us and no matter how we try, we can not do it. Our only salvation is what Christ did for us. May you always keep your most important ruler foremost in your minds no matter what you are doing.

PERSONAL MEASUREMENTS

In the beginning man used his body to take measurements. Today we use rulers and tapes. Noah was asked to build an Ark to house all the animals during the flood. The Lord asked Noah to build an Ark that was 300 cubits long and 50 cubits wide and 30 cubits high. A cubit is the distance from a man's elbow to the tip of his middle finger. In ancient days this distance was defined (by various countries) to be anywhere from 17.5 inches to 26 inches. In the English system, it was standardized at 18 inches. In today's measurements the ark would have been 450 feet long, 75 feet wide, and 45 feet high.

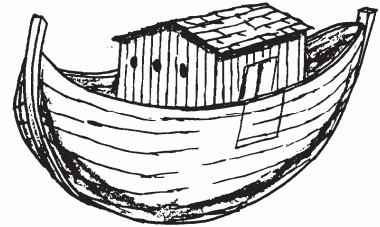


Figure 1

MY PERSONAL MEASUREMENT CHART

My height is _____

Height of my eyes from the ground is _____

My reach from the ground to the tips of my up stretched hands is _____

My reach across from finger tip to finger tip is _____

The length of my forearm from elbow to tip of middle finger is _____

The span of my hand from thumb to tip of my little finger is _____

Width of my thumb is _____

Length of my foot is _____

Some other common measurements we use today also came from the past. The fathom (usually used to measure depth of water) was established by the Egyptians and was the length of a man's outstretched arms (about 6 feet). In the 1100's King David I of Scotland ruled the inch to be the width of a man's thumb at the base of the nail. The foot, that's the easy one. It was the length of a man's foot. The yard originally was the distance from the tip of the nose of Henry I of England to his thumb on his outstretched arm. The mile came from Roman soldiers and was equal to 1000 double steps (or paces, as we will discuss later in this chapter).

We, in the United States, are one of the only countries to con-

Figure 2

tinue using inch, foot, yard, and mile. The rest of the world is almost all using the metric system of measuring. Everyone says we will also go to the metric system in the United States, but that has been said for a long time and may never come to pass. You should get to know both systems of measuring.

To help you make measurements outdoors without using a ruler, take a ruler and record your body measurements for future reference. Remember these will change as you grow, so be sure to update them at least once a year. After you become an adult, they will not change much. Use a copy of the "Personal Measurement Chart" (**figure 2**) to list your measurements.

Another important measurement you will use is your **PACE**, which is the distance that you cover in one step. You will use this in measuring chapters and compass courses. The pace is measured from the heel of one foot to the heel of the other foot. To find out the size of your pace, mark off a distance of 100 feet on level ground. Walk this distance several times and count the steps it takes to go the 100 feet. Divide the distance (100 feet) by your average number of steps to arrive at the length of your pace in feet. Put it on your personal measurement chart. As you grow older, the size of your pace may change so you should recheck the size every year or so.

As you go on your campouts and other Lutheran Pioneer outside activities these measurements should help you. Remember other people will measure Lutheran Pioneers on how you conduct yourself. Lutheran Pioneers is Christ centered and our actions should show that.

MEASURING STAFF

"For in the same way you judge others, you will be judged, and with the measure you use, it will be measured to you." Matt. 7 : 2

Our sin sure doesn't let us measure up very well does it? Christ kept the law perfectly for us and that is really hard to comprehend for us sinners. Paul says it all for us in Romans 7:7 through 7:25. which you ought to read, but Romans 7:19 says it the best. "For what I do is not the good I want to do; no, the evil I do not want to do - this I keep on doing.

Christ should be our ruler for how we should conduct ourselves. Even though we are not capable of keeping all the Commandments does not mean we should not try. Keep Christ out there as an example and what other measuring tool do you need?

One of the possessions most valued by people that do a lot of walking is their staff. Besides helping you as you walk, you can also use the staff (or walking stick) to help you measure small objects and heights as explained later in this chapter.

To make your Pioneer Staff (walking stick), just do the following: Find a nice straight stick 48" long. If you cannot find a nice straight stick, use a 3/4 inch to 1 inch dowel that can be bought in a 48" length at your local hardware store. You could also cut the handle off an old broom to 48". So now what do you do?

It is suggested that you mark off each inch on the staff so measuring will be easier. You could

use paint and paint each inch different colors, or inch wide colored tape works real well. A suggestion could be to alternate gold and red every other inch as they are the Lutheran Pioneer emblem colors. Now take your staff with you on your campouts and outings.

INCH TO FOOT METHOD

You can use your staff to help you measure heights, called the INCH TO FOOT method. Starting at the base of the thing you want to measure, walk 11 paces. Have someone hold your Pioneer Staff at that point and walk 1 more pace. Now, laying on the ground at that point (12th, pace), sight on a line through the staff to the top of the object. For every inch on the staff the object is one foot, therefore the inch to foot method. Also, instead of pacing, you could lay the staff down end to end 12 times, mark that spot, and stand it back up on the 11th. spot, and proceed to measure. (see figure 3)

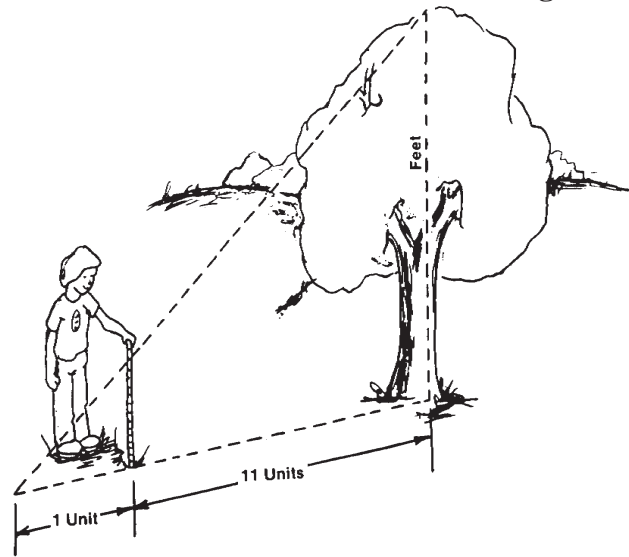


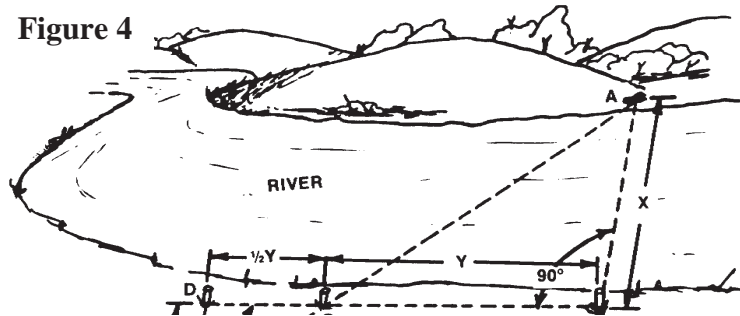
Figure 3

SIMILAR TRIANGLE METHOD

You can measure many distances simply by pacing them off. However there are distances that are impossible to measure by pacing off such as rivers. This is when you can use the SIMILAR TRIANGLE method. Stand on the bank and sight across the river to an object (rock or tree) on the opposite bank. We will call this point A.

The spot where you are standing we will call point B. Drive a peg into the ground here (B). Turn 90 degrees and walk along the bank a given number of paces (say 50) and drive a peg in the ground here, which will be point C. Continue pacing along the bank half the number of paces as before (25) and drive a peg into the ground at this point which is point D. Make a

Figure 4



90 degree turn and walk away from the river (counting your paces) until you arrive at a point that is in direct line with point A and peg C. Drive another peg in the ground here and call it point E. Now the formula. (see figure 4) If the distance from A to B is X and the distance from B to C is Y, then you know the distance from C to D is 1/2 of Y because you went 1/2 the paces.(25 versus 50). The distance from D to E is 1/2 of A to B. (similar triangles) So double the paces you counted when you paced off D to E multiply by your pace length and divide by 12 and you will know how many feet it is across the river. If you wanted to eliminate the doubling of D to E you could walk the same number of paces from C to D as you did B to C (50 and 50) then you would make triangles the same size and A to B and D to E would be the same distance. See now why the length of your pace is important?

HORIZON METHOD

There is an easy way to tell time in the early evening, just before sunset using your hand. Just extend your arm in front of you and place your hand on the horizon as shown in **figure 5** For each finger between the horizon and the sun, there is 15 minutes of sunlight left.

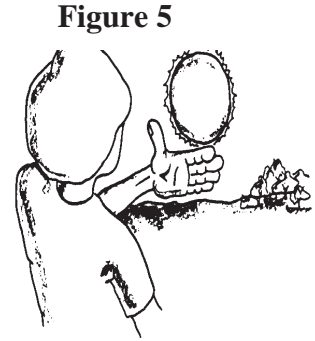


Figure 5

These simple methods for measuring height, distance and time can be used almost anywhere. They are fast and fairly accurate. Try any of them out on some known measurements and you will be surprised at the accuracy. As you continue in this chapter you will learn a couple more methods of measuring height and distance that are just as easy to do and just as accurate.

STICK METHOD

Another method for measuring height is the Stick Method. See **figure 6**. Ask another Lutheran Pioneer, whose height you know, to stand at the base of the object you want to measure (such as a tree), or make a mark on the tree at your own height. Step back. Hold a stick up before you in your outstretched hand. With one eye closed, measure off the stick, with your thumbnail, the height of the Lutheran Pioneer or your mark. then move the stick up the tree to see how many times this measurement goes into the height of the tree. Now it is just a matter of multiplying the height of the Lutheran Pioneer (or your height) times the number you found. Now you have the height of the tree.

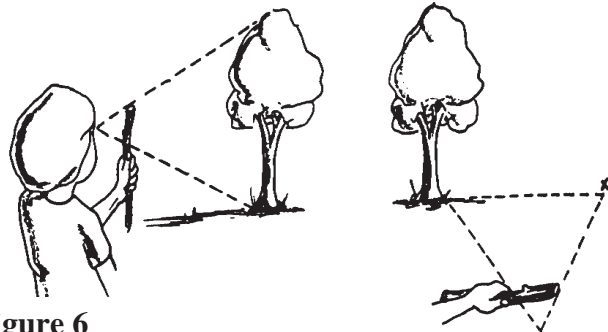


Figure 6

TREE FELLING METHOD

One more method, that is used by loggers, is called the Tree Felling method. Hold a stick upright in your outstretched hand. Move backward away from the object (like a flagpole) you want to measure. See **fig-**

ure 6. Sight to the flagpole in such a way that the tip of the stick covers the top of the pole and your thumbnail is the foot of the pole. Turn the stick 90 degrees to a horizontal position (be sure your thumbnail is still at the foot). Notice the location where the tip of the stick hits the ground. Use a Lutheran Pioneer buddy to mark the spot. Pace the distance from this point to the foot of the pole and you have the pole height. You have formed another triangle here.

In both these methods plus the inch to foot method you could use your Pioneer staff instead of a stick.

NAPOLEON METHOD

There are a couple more ways to measure distances and they are the Napoleon Method and the Compass Method.

In the Napoleon Method of measuring distance (such as across a river) stand on the bank. Bow your head with your chin against your chest. Hold your hand to your forehead, palm down.

Move your hand down until the front edge of it seems to touch the opposite bank. Now, make a half turn (90 degrees), "transferring" the distance to your bank. The distance to the point which the edge of your hand seems to touch is the width of the river. Mark that spot and pace it off. If you wear your Pioneer baseball cap, you could use the brim of the cap instead of your hand. Napoleon would have used the brim of his hat instead of his hand.

SUNDIALS

Now that the fun is just beginning, you will have to keep track of the time. There is a way to do that without a watch by making your own sundial. Of course it all depends on a sunny day. Sundials were used for a long time before clocks were invented. At first people measured the length of a man's shadow, but that soon proved to be very inaccurate because the length of the shadow changes as seasons change. Therefore the position of the shadow became more important than the length of the shadow.

A simple sundial can be made by driving a stick into the ground and then drawing a semicircle around it. See **figure 7**. Take your first shadow length measurement in the morning just after sunrise. The shadow will be the longest then and you can use that length for the radius of the semicircle. The sun rises in the East, moves South and sets in the West. At noon the shadow cast by the stick would point North and will be the number 12 on the dial (12 noon). Starting at North divide the semicircle into 12 equal parts and mark them as in **figure 8**, being careful to mark the numbers on the correct side of 12. Numbers 1 through 6 are marked on the East side of 12. You can now tell the time during daylight hours, for the rest of the campout with this simple sundial. When it gets close to sunset, use the hand on the horizon method you learned to see how much time is left before the sun will set. See if it matches your sundial.

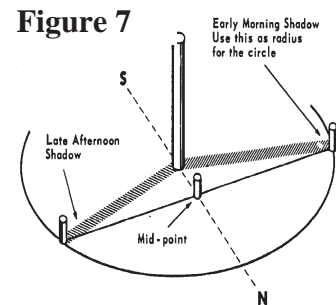


Figure 8

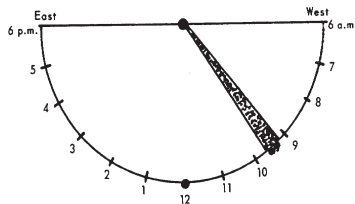


Figure 7

You may want to perfect one or two of these methods of measuring, but it is fun to use them all and seeing if the answers come out close to each other.

Now keep your Pioneer Staff and a compass with you on your Pioneer outings and you should be able to measure anything that you would like to. How are you going to know how you measure up? You need something to tell you how you are doing. The BIBLE is your tool, there is where you will find the answers. Paul says in Romans 7:7. What shall we say then? Is the law sin? Certainly not! Indeed I would not have known what sin was except through the law. For I would not have known what it was to covet if the law had not said, "Do not covet."

You can find the law in the Bible, but what's more important you can also find the Gospel. Use your Bible, the tools to measure how we should conduct ourselves as Christians is in there as is the Good News of Jesus Christ.

Don't forget to keep your most important measuring tools with you also, your Bible and your Lord and Savior. Jesus, He is with you at all times and isn't that great.

OBJECTIVES

CHAPTER 4—MEASURING

Recruit

1. Define the following term: Pace
2. Determine the length of your pace and demonstrate how to measure using your pace.
3. Prepare a list of your personal measurements.

Camper

1. Prepare a list of your personal measurements.
2. Make a walking stick marked off in inches and/or centimeters.
3. Demonstrate the inch to foot method of measuring height using your walking stick.
4. Demonstrate the similar triangle method of measuring distance.
5. Demonstrate the hand on the horizon method of telling time.

Frontiersman

1. Prepare a list of your personal measurements.
2. Demonstrate the tree felling method of measuring height.
3. Demonstrate the stick method of measuring height.
4. Demonstrate the compass method of measuring distance,
5. Demonstrate the Napoleon method of measuring distance.
6. Make a sundial and demonstrate its use.

CHAPTER 5 - FIRE BUILDING

“Can a man scoop fire into his lap without his clothes being burned? Can a man walk on hot coals without his feet being scorched?”

Proverbs 6:27 - 28.



David loved King Saul because Saul was chosen by God to rule his people. Saul did not return that love. Within his heart a raging fire burned out of control and countless times he tried to kill David. The fires of jealousy can destroy a man just as quickly as a roaring forest fire. Play with fire of either sort and you will get burned. Thank God that you have been rescued from the fires of hell by your loving Lord. Now be careful with every sort of fire.



For centuries, fire has been both a friend and a foe to man. A fire can keep you warm, dry your clothes, cook your food and cheer you on a dark and gloomy night. An evening campfire, whether in your back yard or in a National Forest, draws people together in a bond of friendship and peace, but that same fire can turn quickly from a friend to a foe if you are careless. Smoky Bear says, “Only you can prevent forest fires.” Before you go camping this year it is important that you learn how to start, control, and put out a fire.

There are many different types of fires but only three uses. A fire can be used to cook your