

THE  
BIBLE CHEMISTRY COURSE,  
FOR USE IN  
YOUNG PEOPLE'S BIBLE CLASSES.

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## INTRODUCTORY.

Men and boys are always interested in men, hence this series studies the heroes of the Bible. Accordingly the following plan is outlined for the course:

### OLD TESTAMENT.

Adam's Sinfulness.  
Noah's Righteousness.  
Abraham's Faithfulness.  
Jacob's Perseverance.  
Joseph's Purity.  
Moses' Meekness.  
Joshua's Decision.  
Samson's Strength.  
Samuel's Honesty.  
David's Manliness.  
Solomon's Wisdom.  
Daniel's Fidelity.

### NEW TESTAMENT.

John the Baptist's Humility.  
Jesus' Humanity.  
Jesus' Divinity.  
Jesus' Love.  
Judas' Treachery.  
John's Tenderness.  
Peter's Impulsiveness.  
Stephen's Courage.  
Saul's Zeal.  
Paul's Hope.  
Timothy's Training.  
The Ideal Man.

## EXPLANATORY.

In this series the following order is advised as a plan for the study of every character:

1. The general history of his time.
2. The personal story of his life.  
(A suggested outline for presenting this is given on next page.)
3. The chief trait of his character.
4. The value of this trait impressed by a chemical illustration.

Make this principal point as impressive as possible, and review it from the suggestion of the experiment at the next meeting of the class.

While the experiments here given are all very simple, it is important that the leader make each one for himself before the meeting of the class. Almost all the materials needed can be found in any drug store, and most druggists will donate them to help on the work. It is best to have these things provided some time in advance, in case they are not immediately at hand. As some of the materials used are corrosive acids, it is of course well to handle them with care.

A good Bible dictionary will help greatly in the study of the characters.

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## The Times and Life of Moses.

General  
History.

Exodus-Deuteronomy—Assign previously  
daily readings.

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### EVENTS.

#### COURTIER:

Born of ~~Amram~~ Amram and Jochebed.  
Three months at home.  
Nearly forty years in Pharaoh's palace.  
Flight to Midian.

#### SHEPHERD:

Tending Jethro's flocks.  
Marriage to Zipporah.  
Nearly forty years of discipline.  
Call from the burning bush.  
His excuses and their answers.

#### LEADER:

After the ten plagues.  
Journey to Sinai.  
Rameses, Succoth, Red Sea, Marah,  
Elim, Wilderness of Sin (Manna and  
Quails), Rephidim.  
At Sinai.  
The Ten Commandments.  
Journey to Kadesh-barnea.  
The spies sent and their report.  
Wanderings for thirty-eight years.  
Journey to plains of Moab.  
Sin of Moses and Aaron at Kadesh.  
Aaron's death at Mt. Hor.  
The brazen serpent.  
Overthrow of Sihon and Og.  
Moses' closing days.  
Balaam, Joshua, Midian. Allotment of  
E. Palestine.  
Moses' farewell address.  
His death and burial.  
Dwell upon Moses' Obedience, and im-  
press the value of such a trait in men  
and boys today.

Egypt in great prosperity and power.

Palestine still peopled by heathen tribes.

## Talk No. 1.

This meeting of the class should be given to organization and introductory work. The method of organization will vary for different leaders; but it will certainly prove helpful to have some class organization to continue through the season. By all means have the class as a class undertake some special forms of decided Christian work, and have their committees report on all such efforts. A badge also aids in developing class spirit.

Outline before them the plan to be followed. Suggest camping or pleasure trips to be taken later on. Urge by roll-call and otherwise faithful, prompt attendance. Assign daily readings each week in advance, and offer some special honor for keeping up these readings.

At this lesson begin learning the books of the Bible with some such plan as this: O-l-d (three letters) T-e-s-t-a-m-e-n-t (nine letters. And 3 with 9 reads 39.) N-e-w T-e-s-t-a-m-e-n-t (three times nine—27 books.) For the Old Testament, number the five fingers as follows: 5, 12, 5, 5, 12. These are respectively the Pentateuch, the historical, the poetical, the major, and the minor prophetic books. Learn one division at each lesson and constantly review. As constant review is the secret of all successful study, always review the lessons of previous meetings.

## Experiment for Talk No. 2, on Adam's Sinfulness.

### EXPERIMENT.

Have a tumbler half full of pure, clear water. Taste it and speak of how healthful and good it is.

Drop into the tumbler some powdered blue litmus, and give it time to dissolve.

On this colored water throw a piece of metallic potassium about the size of a pea. It takes fire of itself and burns with a purplish flame and turns in all directions.

Pour a little of this liquid into three small glasses.

Now from a bottle containing a solution of chlorine (For making this solution, see Exp. for Talk No. 13.) pour into two of these glasses till they become

clear again. The other glass, not receiving the clear solution, remains corrupt and dark.

### LESSONS.

It illustrates the nature of Adam and Eve before they sinned.

So sin darkened and corrupted Adam and Eve's pure and holy nature.

This reminds us of the flaming sword that turned every way and kept them out of the Garden of Eden.

Thus their sinful nature passes to us.

The clear solution represents Jesus' sinless life.

So Jesus' blood takes away our sin of both nature and practice.

The sinner, refusing Jesus' blood, remains in his sin.

### Experiment for Talk No. 3, on Noah's Righteousness.

#### EXPERIMENT.

Into a small glass dish or saucer, pour a tablespoonful or two of alcohol and light it with a match.

Blow out the flame and then break an egg and put its contents in the dish. Pour on more alcohol and watch the egg slowly and surely cook.

The alcohol has destroyed all the life of the egg.

[Make this largely a talk on temperance.]

#### LESSONS.

The Indians call whiskey, beer and wine, which contains alcohol, "Fire-Water."

So liquor cooks the blood, brain, stomach and all the body, and so it harmed even righteous Noah.

Strong drink will as surely destroy man's life in every way.

## Experiment for Talk No. 4, on Abraham's Faithfulness.

### EXPERIMENT.

Have a teacup quite full of clear water. Into this put about a teaspoonful of zinc clippings finely cut. Add about half a teaspoonful of stick phosphorus very finely cut. (Of course phosphorus should be handled as far as possible under water to prevent its taking fire.)

Now pour in, little by little, some sulphuric acid. A multitude of bubbles will be produced which will take fire at the surface forming almost a fountain of flaming fire.

### LESSONS.

Like pure water, faith also is life-giving.

All this is poisonous, like sin, and so sinful Sodom was in danger of the shower of fire and brimstone.

Sodom's destruction shows the terrible danger of sin and faithlessness. Let us follow rather Abraham's example.



## Experiment for Talk No. 5, on Jacob's Perseverance.

### EXPERIMENT.

Dissolve some small crystals of "blue-stone" or copper sulphate in a test-tube half full of hot water.

Into the blue solution, put the clean blade of a knife, or any piece of bright iron. In about a minute take out the iron when it will be found to be copper plated. Put back and leave in the liquid for some time. The copper not on the iron falls as a dark deposit to the bottom. In time, all the copper will be taken out and the blue color will entirely disappear.

### LESSONS.

Patient perseverance, such as Jacob's was, will in time, surely win the most complete success.

## Experiment for Talk No. 6, on Joseph's Purity.

### EXPERIMENT.

Have a plain solid gold (or say 18k) ring and a new brass or plated ring of the same shape and size. Let the class examine these and vote as to which one is the gold.

Drop the two together in a small vial of strong nitric acid. The brass "goes up in smoke," but the gold is all the brighter for the test.

### LESSONS.

"Judge not by appearances."

Genuine purity, as Joseph's, is a matter of the heart and will endure in temptation.

## Experiment for Talk No. 7, on Moses' Meekness.

### EXPERIMENT.

From a watch repairer get a broken mainspring. Show how persistent it is in retaining its own shape.

Draw the temper from the spring by heating it quite highly over a spirit lamp, obtained from any dauggist. It will readily take and keep any shape you give it.

### LESSON.

So Moses was at first of a stubborn and high temper.

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After the burning bush and his hard discipline in the desert, Moses was meekly submissive to God's will.

## Experiment for Talk No. 8, on Joshua's Decision.

### EXPERIMENT.

Procure a small metal cylinder about three-fourths of an inch in diameter and three or four inches long, and having a hole (about as large as a pencil point) near the closed end.

Generate hydrogen by pouring dilute muriatic acid on some zinc in a bottle. Conduct this hydrogen under water thro' a rubber or glass tube thro' a stopper in the bottle.

Holding the thumb constantly and closely over the small hole in the cylinder, fill the cylinder about half full of water. Now cork the cylinder and, still keeping the small hole carefully closed,

invert the cylinder in the water and remove the cork. Hold the cylinder over the generating stream of hydrogen until it is full.

When the cylinder is thus filled with the mixed gas and air, cork again, still under water. Take out of the water and removing the thumb from the small hole, ignite with a match the issuing stream of gas. A sharp and loud but harmless explosion will result, and the cork will be driven quite a distance.

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### LESSONS.

Joshua's action was decisive and effective as at Jericho and always. So should ours be.

[NOTE:—Part of the experiment for Talk No. 9 should be prepared this time, i. e. the bone put into the acid.]

## Experiment for Talk No. 9, on Samson's Strength.

### EXPERIMENT.

Into dilute muriatic acid (one part acid to eight parts water), put a long, strong, dry bone. Let it remain over to the next week, when it will have become so soft and pliable that it may be tied into a knot.

### LESSONS.

Even the strongest man, as Samson, may be so weakened by sin as to be entirely helpless of himself.

## Experiment for Talk No. 10, on Samuel's Honesty.

### EXPERIMENT.

In one glass, put a counterfeit coin, and in another put a genuine silver coin. It would be well to have these as much alike as possible. Cover each with about a half inch of dilute nitric acid. Let them remain about three minutes, and note the changes in them. The counterfeit will be quite blackened and defaced, while the true one is really brighter than before. Pour off the acid and rinse the coins well and rub them with cloth. Note the great difference.

### LESSONS.

Be—as Samuel—honest, not in pretence, but in practice.

## Experiment for Talk No. 11, on David's Manliness.

### EXPERIMENT.

Fill a tumbler with pure clear water. Add about a teaspoonful of tincture of iodine from a dark bottle.

Now add a little of a saturated solution of sodium hyposulphite. It will all become perfectly clear again.

Add the iodine drop by drop. It does not color now, because so much of the other solution is present in the tumbler.

### LESSONS.

True manliness is pure.  
So unmanly acts darken and corrupt the whole character.

The love of God thro' Christ in us makes us free from sin.

If we have sufficient of the love of God in our hearts, we will be free from unmanly and sinful acts. David was "a man after God's own heart."

## Experiment for Talk No. 12, on Solomon's Wisdom.

### EXPERIMENT.

Fill a china teacup one-third full of granulated sugar. Pass around and have all taste the sugar.

Now fill the cup nearly full of hot or warm water. Stir well until all the sugar is dissolved.

Add, little by little, concentrated sulphuric acid. As the cup is filled, a black bitter mass will swell up and fill it to overflowing.

(The cup should be placed in a large plate to catch this overflow.)

### LESSONS.

Rightly used, Solomon's wisdom was valuable and sweet.

But even wisdom wrongly used brings only ruin.



## Experiment for Talk No. 13. on Daniel's Fidelity.

### EXPERIMENT.

Write with red (carmine) ink on a strip of paper the name "Belshazzar."

On another strip, write with printers' ink the name "Daniel."

Have some chlorine water freshly made. (See directions below.)

Now put both strips into the solution. "Belshazzar" will fade out entirely, but "Daniel" will remain very firmly fixed.

Chlorine water may be easily made by putting a small amount of chlorate of potash into a bottle and pouring on a little muriatic acid. When fumes begin to appear, add about a half inch of water. This should be prepared before the experiment is given in the class.

### LESSONS.

How firmly we shall stand, depends upon what we are,—our fidelity to God, such as Daniel surely had.

### **Talk No. 14.**

Presuming that the arrangements referred to in Talk No. 1 have already been effected, this meeting should be given to special introduction to the New Testament. Describe vividly for the class, the stirring events of Jewish history in the interbiblical period, and explain the relation between the Old and New Testaments, their names, etc.

An effective way of having the names of the books memorized thoroughly and in their proper order, is to hold a competitive recitation of them, like a "spelling match." A reference race, testing quickness in finding references, is also stimulating. Wall maps should be provided for use before the class.

## Experiment for Talk No. 15, on John the Baptist's Humility.

### EXPERIMENT.

Dissolve some sugar of lead in a small bottle of water. In this solution, suspend, by means of a small wire through the stopper, a strip of zinc. In a few hours the zinc will begin to dissolve away and lead will collect on the remaining strip of zinc in the form of a beautiful tree of crystals. The zinc strip decreases that the lead may grow.

### LESSONS.

In his humility, John the Baptist unselfishly gave up himself that Jesus might increase.

## Experiment for Talk No. 16, on Jesus' Humanity.

### EXPERIMENT.

Have a tumbler of clear water, in which has been put a small spoonful of tannin.

From a black bottle containing some tincture of iron, drop one or two drops into the tumbler. It will all become very quickly black.

Take a small bottle of chlorine water (See experiment Talk No. 2) which has been colored red with a few particles of permanganate of potash. Pour from this into the dark solution above. Immediately it will become clear as at first.

### LESSONS.

This shows the beauty and purity of man's nature as he was created.

How dark even one sin makes our hearts and lives.

This suggests Jesus' blood as shed instead of ours.

So Jesus' blood will cleanse sin from our hearts, if we accept his death in our stead.

## Experiment for Talk No. 17, on Jesus' Divinity.

### EXPERIMENT.

At the sign painter's or book-binder's get a sheet of gold leaf. Have him explain how to handle it.

Notice that when it is held up to the light it is green by transmitted light and yellow as usual by reflected light.

Now put about half of the leaf into each of two small vials. Into one pour a small amount of nitric acid. Into the other pour three times as much muriatic acid. Neither dissolves the gold. Pour the two together and the gold immediately dissolves.

### LESSONS.

Jesus is both God and man, and either as we choose to regard him.

The divine-human Jesus exists today, though spiritual and unseen.

## Experiment for Talk No. 18, on Jesus' Love.

### EXPERIMENT.

Have one bottle of pure clear water. Put in about a teaspoonful of corrosive sublimate. It is now a most dreadful poison.

From a large bottle containing a solution of iodide of potash, pour into the first bottle until it all turns red.

Pour in more of the iodide and it will all turn quickly clear again.

### LESSONS.

Our nature created pure.

Sin has so corrupted our purity of soul. We are thus doomed to die.

Jesus' life was so clear and bright and his life shows us to be sinful.

So Jesus' loving life and death for us will free us from all sin.

## Experiment for Talk No. 19, on Judas' Treachery.

### EXPERIMENT.

Into a saucer put some water and a few pieces of ferrous sulphide, and pour on some sulphuric acid.

A very disagreeable odor is at once freely given off and soon fills the entire meeting room. Such a smell will not soon be forgotten. (Of course this experiment is to be made at the conclusion of the meeting.)

### LESSONS.

All of these things are quite useful in their proper way.

But when wrongly used, as Judas used his chances, they become as noxious as was Judas' treachery.

## Experiment for Talk No. 20, on John's Tenderness.

### EXPERIMENT.

Obtain some solution of either cobaltous chloride or cobaltous nitrate. This is called "sympathetic ink."

Write with ordinary black ink the word "John's" and following in the same line, write with sympathetic ink the word "Tenderness." Now warm very gently and the last word will come out in beautifully colored letters. If the paper be then moistened very slightly, as by breathing on it, the last word will become invisible again.

### LESSONS.

John, who so loved Jesus and whom Jesus loved, was tenderly sympathetic.

So, on occasion, our tenderness should be visible to all, and it should always be a part of ourselves.



## Experiment for Talk No. 21. on Peter's Impulsiveness.

### EXPERIMENT.

On the bottom of a shallow saucer spread some metallic iodine. Cover this with a strong solution of ammonia, and let it stand for a few minutes. Mix up to a brown paste and spread on pieces of blotting paper to dry. When entirely dry, (which will take several hours) it is extremely sensitive and will explode, at a light touch or blow, with a loud and sharp but perfectly harmless noise. When perfectly dry, it will go off at even the touch of a feather.

### LESSONS.

It is thus with over-sensitive and impulsive people, such as Peter naturally was.

## Experiment for Talk No. 22, on Stephen's Courage.

### EXPERIMENT.

In a cup melt some paraffin wax, and with a fine brush or piece of cloth put a coating of the wax on a piece of window pane. Through the wax scratch with some sharp point the words "Stephen's Courage."

Put some powdered fluorspar in a small lead tray—to be gotten at the plumber's—and add enough strong sulphuric acid to make a thin paste. [Note: Do not get this mixture on the hands.]

Over this tray put the piece of glass, wax downward, and let it remain so for several hours. The words will then be found etched in the glass.

### LESSONS.

As no other than hydrofluoric acid could dissolve glass—one of the hardest of our common substances—so only such courage as was Stephen's could endure the stoning he received.

## Experiment for Talk No. 23, on Saul's Zeal.

### EXPERIMENT.

Mix one part of pulverized manganese dioxide with four parts of pulverized chlorate of potash. Put the mixture into a large test tube, one having the tube arranged so as to collect the gas, (See the directions for collecting gas given for Experiment, Talk No. 8). Heat slowly and strongly. After the gas begins to issue freely, collect in a large bottle and cork up for use.

Now tip the end of a watch spring—which may be obtained of any jeweler—with a little sulphur and set fire to the sulphur. Put this down into the bottle of gas. The steel spring will burn with most beautiful scintillations.

### LESSONS.

Pure oxygen is wholesome and life-giving. Christ gives his life in the spiritual sense.

When Saul was converted, his ardent zeal became aflame with love for Christ.

## Experiment for Talk No. 24, on Paul's Hope.

### EXPERIMENT.

Into a bottle put about half a handful of zinc. On this put some very dilute sulphuric acid.

Have the bottle arranged so as to lead the gas evolved through a small tube tapering at the end (like a medicine dropper or fountain-pen filler). On this tube fasten with a small rubber band a collodion balloon. When the latter is thus filled and released, it will rise at once to the ceiling. (Soap bubbles also will work beautifully this way, and ordinary illuminating gas may be used to fill the bubbles. Connect from the burner with a long rubber tube.)

### LESSONS.

As a faithful Christian, Paul was always bouyed up by an inspiring hope.

## Experiment for Talk No. 25, on Timothy's Training.

### EXPERIMENT.

Into a test-tube one-fourth full of water put a piece of "Rose' Metal." When heated to the boiling point, the metal will melt, and when the contents of the tube are cooled, the metal will be molded to fit the tube exactly. Now break the glass off, and the metal will retain its shape.

("Rose' Metal" may be made as follows: Over a blast-lamp, borrowed from any plumber, arrange a little porcelain cup or crucible. In this put by weight one part each of lead and tin and two parts of metallic bismuth. Heat slowly until all melt together. The alloy melts at about 200 deg. F., while tin, bismuth, and lead melt separately at 445, 395 and 608 deg. F. respectively).

### LESSONS.

"Train up a child in the way he should go, and even when he is old, he will not depart from it." So Timothy was trained:

This shows the vast influence of association in molding character.

### **Talk No. 26, on The Ideal Man.**

In this concluding meeting of the class, make it the one prayerful purpose to bring all the class to an open and decided stand for the Christian life. To this all-important end, make the chief attraction the attractive Christ. Show how he combines in himself all the good traits we have seen and many more besides. Emphasize the profit and pleasure of the Christ-like life, and above all, make a strong appeal for full surrender to Him who gave up all for us.

As they shall thus resolve, give them all the motto, Rom. 12:11. As a final word, and kneeling down together, give God all the glory.

Trusting that this series may lead many boys to follow the Manliest of men, the author lovingly commits it to all friends of boys.