

# CHEMISTRY 101

*An Overview of God's Chemical World*

## Course Accreditation Program

Westfield  
Studios



**101**

Name of Student \_\_\_\_\_ Age \_\_\_\_\_

Start date \_\_\_\_\_

Completion date \_\_\_\_\_

Total hours taken to complete program \_\_\_\_\_

## Welcome to Chemistry 101! *An Overview of God's Chemical World*

We are very excited for you to watch these films and learn new and wonderful information about our God and His creation!

The DVD films are the heart of this program. The films contain the distilled basics of beginning chemistry that you can watch over and over. If you grasp these basics, you'll have a rock-solid understanding of God's chemical world.

For further study, the Guidebook puts most of the DVD content in print and adds lots of interesting information. Included at the end of each chapter are discussion questions and a quiz covering that section.

For those looking to fulfill a required one-year high school credit, the Accreditation Program is for you! Typically, one credit requires between 120-180 hours of study. There are about 155 hours of projects and over 30 hours of labs in the Chemistry 101 High School Credit Program. You don't have to do all of them and the course is *very flexible* to meet your schedule and what fits your family best. Program activities include:

- Using the DVDs and Guidebook
- Making a Chemistry 101 Notebook to record all your work
- Research and lab reports
- Interesting discussion questions
- Conducting labs using items mostly found around your home
- Taking field trips
- Using resources on the web and at your local library

Part of your reading even includes choosing chemistry books from the juvenile section of the library! These publications typically present the information in an interesting and easy to understand form and they are filled with entertaining and relevant information. This helps make learning possible as well as fun.

We hope your whole family enjoys the process of learning together. *Solve et Coagula!*

-The Olson family at Westfield Studios

# GETTING STARTED

## “HOW MUCH TIME SHOULD I PLAN?”

We suggest you plan on doing one segment every two weeks, which is 4 or 5 hours of chemistry each week. If you start in September, you'll be done around June the following year. At the top of each segment in the Accreditation booklet, you will see each two week segment where we suggest you should be for that section.

1. **MARK YOUR CALENDAR.** Mark a calendar for where you should be at the end of each week. This will help you stay on track. Be flexible. If you fall behind, just do the basics and catch up - forget about “I MUST GET ALL THE HOURS IN!!” This is *your* schedule. Better to do 90 hours of chemistry with joy than 130 hours with stress and strife.
2. **PRINT THE GUIDEBOOK AND ACCREDITATION BOOKLET.** These files are found on Disc D. The instructions (Windows) are printed on Disc A. If you have any trouble, write us at [comments@the101series.com](mailto:comments@the101series.com) and we will send you the files directly. You can also take the disc to a print shop like Staples. (Copyright permission is at the bottom of this page and in the Guidebook.) Print the Guidebook in black and white, double sided, spiral bound with a clear front cover and black back cover. The Accreditation Booklet can be printed front and back then center stapled.
3. **PRINT THE "CHEMISTRY 101 EXTENDED PERIODIC TABLE."** Our Periodic Table comes on three pages because it is the extended or long version. You can use your home printer or a local print shop like Staples. Cut the excess margins off the pages so you can tape them together and form one long periodic table. You will refer to this often while watching the films. Also on the same disc, you will want to print off a copy of "*Road to the Periodic Table-The Scientists*". Print it in color if you can- it will be handy for study.
4. **CREATE A CHEMISTRY 101 NOTEBOOK/SCRAPBOOK.** Students are asked to start a "Chemistry 101 Notebook" in segment one. All the work, research and reports should be recorded in this book in whatever form they like. They can use a computer too if they prefer. Have fun with this. It's their notebook/scrapbook/journal of their Chemistry 101 journey.
5. **COLLECT THE ITEMS.** The next page in this booklet has a “Quick List” of items used in each lab. Almost everything you will need for labs you already have in your home or is easily obtained at the grocery store. The exceptions are LED's, dry ice and some solid copper wire. If you are unable to get these materials, don't worry. Just skip that experiment...if your student will let you!
6. **WATCH THE FILM & DISCUSS.** Once you have an idea of what is ahead, watch the film together and do the *Discussion Questions* found at the end of each segment in the Guidebook. Then formulate a plan of how you want to do the activities in the Accreditation Program over the following two weeks.
7. **LABS & 200 WORD REPORTS.** There are 21 labs requiring about 32 hours of lab work. Most of these labs are seen in the film. Your student can use library books, encyclopedias or internet articles to gather the information. *All reports should be read aloud by the student to the family or to the teacher.* After the experiment is completed, add the this information into the report.  
Note: This icon ☺ means the experiment is located about that many minutes into the film giving a quick way to locate that section. “How long is 200 words?” Paragraphs 7 and 8 in this Getting Started page are together about 200 words long. Unless otherwise stated, all *Chemistry 101* reports are 200 words long.
8. **SIGN OFF EACH TASK.** A lot of learning is gained by having to explain a concept to someone else. All sections accomplished, especially those presented to another person, should be signed off by the person who heard the presentation or by the instructor.

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Permission is given to you and your print shop to make copies of this Accreditation program and Guidebook for your family or class.

Revision 06-17-17

## Quick List of items in experiments

I was trying to avoid making an “official list of things you need” as I wanted *Chemistry 101* to be sort of “grab what you have in the junk drawer” science. But not everyone has a fluorescent rock and dry ice sitting in their junk drawer, so here is the list!

### Segment 1

- Pot with lid
- Water
- Salt
- Empty bottle
- Quarter

### Segment 2

- Birthday candles
- Baking Soda
- Glass mason jar
- Play-Doh<sup>®</sup>
- Glass dish
- Water

### Segment 3

- 9 volt battery
- Couple of pieces of solid copper wire.

### Segment 4

- Get something phosphorescent (“glow-in-the-dark”)
- Get something fluorescent (*fluorescent light, fluorescent rock, etc*)

### Segment 5

- Box or pillow case
- Six or seven fun items

### Segment 7

- Big Box of Crayons. At least 7 main colors (red, blue, brown, etc) and 5-7 variations of that main color plus gold and silver if you can get them: *the more colors the better!*

### Segment 6, 8

No labs

### Segment 9

- Water faucet
- Comb
- Balloon

### Segment 10

- Mentos<sup>®</sup> mints
- Liter of diet cola
- Bottle or jar
- Vegetable oil
- Salt
- Food coloring
- Alka-Seltzer<sup>®</sup> tablet

### Segment 11, 12

No lab

### Segment 13

- Can of diet and regular cola
- Water container (*see description in lab*)
- Sugar and aspartame packets (*next time you go to a restaurant ask the waitress and she'll let you take a couple of each home.*)
- Glow-in-the-dark stick (*virtually every store has these*)
- Safety glasses and gloves are useful here but not mandatory.
- Red cabbage
- Pot for boiling water
- Several small glass containers
- Baking soda, lemon juice, vinegar, bleach
- Paper or cloth strainer (*like a coffee maker*)

### Segment 14

No lab

### Segment 15

- Balloon
- Candle and matches
- Dry Ice pieces or chunks (*maybe 2 pounds*)
- Balloons

### Segment 17

- Lemons (3)
- LED (“light emitting diode”...Radio Shack anyone?)
- Galvanized nail
- Solid copper wire

### Segment 17

- Magnesium fire starter (*in nearly every store*)
- Wood chips and tinder for fire
- Hot Dogs or marshmallows? (*optional*)

### Segment 18

No lab

### Segment 19

- Corn starch
- Bowl
- neodymium magnets (*optional*)
- iron filings (*optional*)
- vegetable oil (*optional*)

## Segment 1 The Last Alchemist

Week 1 and 2	Target hours	Actual hours	Sign off
START NOTEBOOK AND PERIODIC TABLE TIMELINE			
<p><b>Start a "Chemistry 101 Notebook"</b> where you record all of your work done in this accreditation booklet. This record of your work can be done with a paper notebook or on a computer.</p> <p>Periodic Table: Print out and tape together the 3 sheets forming the long form of your periodic table. The files are found on Disc D.</p>	½ hr		
<p style="text-align: center;"><b>DVD: Watch "The Last Alchemist."</b></p> <p>Review with your instructor and/or family what was on the film.</p>	1 hr		
Read and study the Guidebook on Segment 1	½ hr		
DISCUSSION			
Talk about the "Discussion Questions" at the end of Segment 1	½ hr		
READING & RESEARCH			
Do research on the two topics: Distillation & Boyle's law ♦Write a 200 word report on each one.	2 hrs		
LAB			
<p><b>Lab #1.</b> Conduct the distilling experiment in the film. Add experiment notes to your report and read it to someone. ⌚19:20</p>	1 hr		
<p><b>Lab #2</b> Repeat the experiment of Boyle's Law on expanding gases using the bottle and the quarter.            ♦Add your findings in your report.            ♦ Explain Boyle's law to someone.            ⌚29:30</p>	1 hr		
The phlogiston experiment will be conducted in segment 2			
HISTORIC TIMELINE			
The film shows a montage of events, persons and places from the Renaissance and is also listed in the Guidebook on page 3. Look up each one so you have an idea of who they were or what the historical event was. ⌚23:00	1 hr		
FINAL			
<p style="text-align: center;"><b>DVD: Watch "The Last Alchemist."</b></p> <p>Read the Guidebook on Segment 1 again</p>	1 hr		
Take the quiz at the end of Segment 1	½ hr		
<b>TOTAL HOURS FOR ALCHEMIST</b>	<b>9 hrs</b>		

## Segment 2 The Birth of Modern Chemistry

Week 3 & 4	Target hours	Actual hours	Sign off
<b>DVD: Watch "The Birth of Modern Chemistry"</b> Review with your instructor and/or family what was on the film.	1 hr		
Read and study the Guidebook on Segment 2	½ hr		
DISCUSSION			
Talk about the "Discussion Questions" at the end of Segment 2	½ hr		
READING & RESEARCH			
Do research on the candle experiments. Explain why the candles go out in each situation. ♦Write your 200 word report	1 hr		
LAB			
<b>Lab #1</b> Conduct the carbon dioxide & candle experiment seen in the film ⌚25:00	1 hr		
<b>Lab #2</b> Conduct the phlogiston experiment in the film. You can use a mason jar to cover the candles, Play-Doh® to hold the candles and a dish to stick the Play-Doh® on. ♦Add your experimenting to your report and read it aloud. ⌚9:10	2 hrs		
FINAL			
<b>DVD: Watch "The Birth of Modern Chemistry"</b> Read the Guidebook on Segment 2 again	1 hr		
Take the quiz at the end of Segment 2	½ hr		
<b>TOTAL HOURS FOR MODERN CHEMISTRY</b>	<b>7½ hrs</b>		