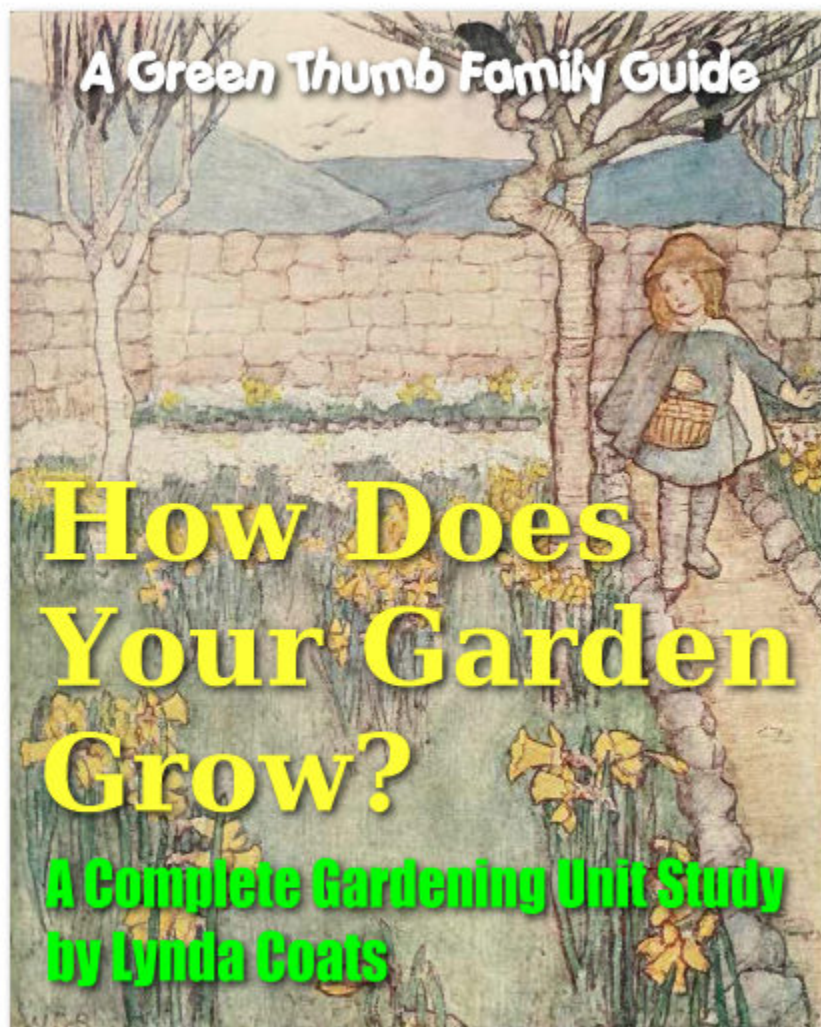




How Does Your Garden Grow?

A Unit Study for Elementary Grades
by Lynda R. Coats

A Green Thumb Family Guide

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To the Parent/Teacher

Welcome to this unit study designed to help your family grow in your walk with the Lord Jesus while you grow a bounteous garden of your own. It is our desire to glorify God in all that we do and to help your family draw nearer to Him and closer to each other through this experience. It is our prayer that you will have fun, learn a lot about growing plants, and reach new heights in your spiritual lives.

While this study is based around gardening and should be used in conjunction with growing a garden, it is NOT designed to teach your children to grow a garden. We have provided many activities and resources to help with that portion of the project, but this is not a step-by-step how-to manual. Instead, it is a resource for extending the gardening project to cover all school subjects to making it an integral part of your homeschool curriculum. If you need actual instruction on how to perform the gardening tasks, please supplement the materials given here with more detailed explanations from other parts of your "Gardening Tool Kit" or other appropriate materials found online or from your library.

For those of you who are new to unit studies, we have included some basic guidelines on using unit studies on the following page. If you are accustomed to the unit study approach to education, feel free to skip this and dive right into your study. Either way, these are ONLY guidelines. You should feel free to adjust this material as you see fit for your own family.

It is our prayer that this unit study will help you and your family, learn much, strengthen family ties, and draw closer to the Lord as you grow beautiful flowers and/or delicious fruits and vegetables.

General Guidelines for Using Unit Studies

1. As with all unit studies, you will need resources not provided here. However, we have tried to keep these to a minimum and to recommend those that are easy to find or are included in the “tool kit” that came with this study. You will find other suggested resources online or in your library. If you still cannot find a particular book or other item, feel free to substitute from what you have on hand or in your local library or can locate on the Internet.
2. The material here is easily usable by students in middle school or above and can be shared with younger children to make this truly a family study. You can facilitate this by adding additional books, videos, or other resources, specifically for younger ages, having older children help younger ones, and/or using recommended books as read-alouds for those who cannot read them yet.
3. The best way to get the most out of a unit study is for the students to do as much of the planning and set up as possible. Depending on their ages and ability levels, you may need to assist in this, but try to give them the lead. For this reason, all instructions are given directly to the students. Those who are able should be encouraged to read the directions for themselves and to their younger siblings.
4. There are many more activities here than any one family will use. The idea is for you to choose the ones you think fit your family’s interests, learning styles, specific needs, and abilities. If you are not familiar with learning styles and how to determine those of your children, you may wish to check out the e-booklet *That's not My Style*, available for download at www.lyndacoats.com
5. When picking activities, be sure to cover all basic ideas and skills taught in the material for full benefit from the study. To make this easier, activities are presented in groups according to the primary subject covered, not in the order in which they should be used.
6. We have listed all of the activities directly related to the gardening project together for you. However, some activities in each of the other areas relate to each step of the gardening process. Check check all sections of activities each time your garden progresses.
7. Many activities actually cover more than one subject area. For that reason, each activity is coded with all subject areas covered. See the code list immediately following these guidelines for meanings of the code designations.
8. You will notice that many of the activities in this unit study use materials in the gardening Tool Kit that came with it. Those that are not in there will be listed at the end of the unit, including sources for finding them and ordering information whenever possible.

9. Other than activities relating to the actual gardening chores, there is no set order in which activities must be done. Some activities fit best with certain parts of the gardening process, and others are built upon previous activities, so you will want to group those together. Otherwise, use your own judgment.

Subject Area Codes

- A Art (drawing, painting, lettering, sculpture, pottery, art appreciation)**
- B Bible (stories from the Bible, memory verses, Christian character, spiritual growth, ethics)**
- C Cultural Studies (philosophy, sociology, psychology, comparative religion, world cultures, languages)**
- E English (composition, creative writing, debate, discussion, grammar and rhetoric, handwriting, journalism, reading and literature, research, spelling, vocabulary development)**
- F Fitness (exercise, PE, nutrition, health)**
- H History - related subjects (anthropology, archeology, civics, economics, history, government, geography, map skills)**
- I Information and Computer skills (computer literacy, graphic design, keyboarding, programming)**
- L Life Skills (automotive maintenance/repair, career awareness, childcare, gardening, homemaking, household maintenance, job search skills, landscaping, personal responsibility, practical crafts, vocational areas)**
- M Mathematics (calculations, computations, (making and reading) graphs, ratio, proportions, algebraic concepts, basic geometry, statistics, personal finances)**
- P Performing Arts (dance, drama, dramatic reading, instrumental music, music theory, musical composition, public speaking, recitation, singing,)**
- S Science (biological and life sciences, physical sciences, technology, ecology, Earth science, astronomy)**
- T Thought processes (creative thinking, critical thinking, decision-making, discernment, following directions, listening, observation skills, problem solving)**

Gardening Skills

1. Before starting your garden, prepare a logbook (journal) to use for keeping a record of your gardening project. You can find directions for doing this at www.howstuffworks.com/keeping-a-garden-log.htm. Now is the time to plan how you will do the log (in a notebook, on the computer, or some other form) and set it up for regular entries as your garden progresses. (E, L)
2. Use your artistic or computer graphics skills to decorate the cover of your logbook (and the pages inside as well, if you wish). (A)
3. If you have never done so, you may wish to have your soil tested by the county agricultural extension service. Make an appointment in advance and have the agent explain to you how soil testing is done and what it measures. Be sure to get copies of brochures and handbooks they have about soil, plants, and gardening. (S)
4. When your soil analysis report arrives, read over it and ask the county agent any questions you might have. Determine what plants will grow well in your soil and what nutrients will need to be added to grow various things. (L, S)
5. Based on what you have learned from the previous activities, pick the spot you plan to use for your garden. Be sure to take into account the availability of water, the relative amounts of sun and shade, the type of soil, and level of drainage, to be sure the spot is acceptable for the plants you plan to grow. (S)
6. Use any of the materials listed in our resource guide, plant and seed catalogs, gardening websites, materials provided by the agricultural extension office, or any other available resources to determine the types of plants that should grow well in your area and growing conditions. Decide which plants you want to grow and research to find out how they are propagated. A large part of this is deciding if you want to grow vegetables, flowers, or both. (L, S)
7. Read *Attracting Butterflies to your Garden* and determine if this is one of your goals for the garden you are planting. If so, research each of the plants recommended for that to determine which ones will grow well in your area and fit well with the rest of your garden. (E, S)
8. Use your soil analysis report and everything you learned about soil from the county agent and the agricultural college to determine what nutrients need to be added to your soil to grow the plants you have chosen. (S)
9. Study your soil analysis results, the books *Gardening: An Elementary School Text*, *Treating of the Science and Art of Vegetable Growing* and *The Children's Book of Gardening 1909*, other books or materials you have on hand, and available information online to find other steps needed for preparing your soil and follow them. (E, S)

10. Now that you know what you want to grow and where you will do it, time has come to design your garden. Investigate the various garden plans at [Garden Design](#), [Nature Garden Activities for Kids: Family Flag Flower Bed for Kids](#), gardening magazines, or other sources to find a desirable shape and plan for your garden. (A, E, L)
11. While planning your garden design, investigate a variety of garden styles used in various parts of the world and different time periods, including the formal gardens of England, truck gardens often used for vegetables, the 'kitchen garden' used in Medieval Europe and early America, and raised bed gardening where space is limited. (H)
12. Purchase and learn to mix and apply fertilizers, peat, topsoil and other nutrients needed to make your particular soil good for growing the plants you have chosen.
13. Measure your garden plot, using both metric and standard American units of measure. Note all the dimensions in your garden log along noting which plants will go in which areas. (M)
14. Once you know the size of the garden and the amount of space allotted to each type plant, you must determine how many of each plant to buy. To do this, read the seed, bedding plant, or bulb packages to find out how much space each plant needs to grow properly and then compute how many of each plant will fit in the allotted space. (S, M)
15. Using one or more resources about organic gardening, find out how it is different from what most people do. Look up the organic alternative to each chemical commonly used in the garden and determine which method you would prefer for your own garden.
16. Now you are ready to turn up the soil, add the proper pre-mixed nutrients and get your plants in the ground. Follow directions on the containers in which the plants came, the appropriate sections of the books *Gardening: An Elementary School Text*, *Treating of the Science and Art of Vegetable Growing* and *The Children's Book of Gardening 1909*, and other books or materials you have on hand.
17. Put everything you have learned to this point getting your plants into the ground. Be careful to follow directions for adding nutrients and for using various tools. (S)
18. Once your plants are in the ground, you should label each bed, mound, or row, so you will know what is going to be coming up there. This can be as simple as placing a stake at each row with the name of what is there or you can go more decorative.

19. If possible, try to find pictures of each seed plant that show how it will look when it first sprouts. That will help you identify them and prevent pulling them up as weeds later on.
20. You will want to mulch your plants according to the best directions for each type. Some plants are mulched when they are planted; others should be done only after the plants have sprouted. Find out what yours need and handle each accordingly.
21. The next requirement you need for your plants is some type of water source. If there is not a source of water nearby, you will have to provide it by irrigation or toting water each day.
22. Now that your plants are beginning to grow, you will have to care for them. Follow the instructions in any of the materials you received with this study to help you learn how to do that.
23. BE sure to continue to care for your plants on a consistent basis. They will not grow if they are not given proper care.
24. Once the plants start growing, you must weed them regularly to prevent letting them be choked out like some of the plants in the parable of the sower. This is a regular thing, not something you can do one time and be done.
25. Once your plants are grown and have begun producing, it is time for the harvest. Some plants produce the entire crop all at once and are then done. Other plants produce continually over a period of time. You will need to consult your gardening manuals to see which you have and how to harvest each of them. Most ripe fruits or vegetables must be harvested very soon after they are ready or they will start to lose their nutritive qualities.

Supplementary Activities

BIBLE AND CHRISTIAN CHARACTER

26. Before beginning work on your garden, take a look at Genesis chapter 1 to see how God prepared His garden spot before planting the Garden of Eden. Even though all He had to do was speak for each thing in creation to appear, it is obvious that much thought went into every step. List some of the things you can see in nature that show God's grand design. (B, S)
27. Read about Adam and Eve and their relation to the Garden of Eden in Genesis 2 and 3. Discuss the meaning of the word "dominion" and what responsibilities that involved for Adam. (B, S)
28. Look at Psalm 1:3 to see the importance of proper location for growing things. Write a paragraph or essay to explain how a godly man can be compared to a tree planted in a particularly good location.
29. Read and memorize the parable of the sower in Matthew 13:3-8. You will be reading this several times with a slightly different emphasis upon each reading. (B, E)
30. Read the same passage in Mark 4:3-8 and in Luke 8:5-8. Discuss any differences between the three versions. (B)
31. Look at Matthew 13:4 and determine which step of the gardening process could have prevented this particular failure.
32. Compare the way a gardener would choose his garden spot with the things we should do to assure that we are "sowing the seed of the gospel" onto ground that is ready to hear it. List things that might keep a person from being able to receive the Gospel when it is presented. For each obstacle list a way that we could remove it.
33. Prepare a poster or chart showing things we can do to help "prepare the ground" before or while telling others about our Savior.
34. Read the parable of the sower from Matthew 13 (or one of the other two locations) again and discuss with your parents and/or siblings what it says about the need to choose the proper place to grow a garden. Do you think that means we should only share Christ with people who will listen? Explain your answer.
35. Discuss what the parable of the sower tells us about the need to prepare our ground before we sow seed into it.

36. Look at Jesus' explanation of this parable in Mark 4: 13:20 and discuss what this says to us about the way we share the Gospel message and about why some who hear are saved and some are not.
37. Brainstorm or mind map with your family how you could help remove the obstacles from this parable that might stand in the way of people you know coming to the Lord.
38. Read John 10 and examine the comparison made there between the believer and a fruitful vine. Mind map some ways that we are like vines in our relationship to Jesus and other believers.
39. Read John 12:24 and discuss the spiritual meaning of these words of Jesus. ("Truly, truly, I say to you, ^(A)unless a grain of wheat falls into the earth and dies, it remains alone; but if it dies, it bears much fruit.")
40. Look up and study the parable of the wheat and the tares in Matthew 13. Discuss it to answer the following questions: How do people in God's church resemble the wheat and the tares? (Bear in mind that tares look just like wheat until the fruit (grain head) is fully formed.) How can we tell if professing believers truly know that Lord? Is it our job to make that decision?
41. Read John 15: 1-11, which relates the Christian life to the growth of a vine. Explain the role of each following in our lives according to these statements of Jesus: Jesus, God the Father, individual Christians.
42. Discuss the implications this passage has for our relationships to other Christians as branches together on the same vine.
43. Look at what Jesus said would happen to those who do not "abide" in Him (the vine)." Talk about how to be sure this does not happen to us and list ways that we can continue to 'abide'
44. Discuss with your parents and list examples of the "fruit" that could be seen in the life of a Christian believer. Examine your own life for the presence of that fruit. Are you truly abiding in Christ? If not, discuss the matter with your parents and get it right with God now.
45. Read Galatians 5:22-23 and list all the fruit of the spirit that should be showing in the lives of God's people. Discuss with your family whether or not they can see each of those fruits in your life.

46. Learn to use a Bible concordance (we recommend *Strong's*) to find verses of Scripture using any word in the Bible. Be sure to use a concordance that is designed to go with the version of the Bible you use, or some words may not be there.
47. In addition to the printed concordance (but not instead of, please), you may want to learn how to look up Scripture verses by verse reference, key words, or topics online. There are many site to use for this. My personal preference is www.biblegateway.com. Check out this site or others, being sure to stay within the guidelines set by your parents.
48. Read the parable of the sower again and talk about weeds and how they get into our gardens. How does this relate to our spiritual lives and what must we do to keep them out?
49. Work with your parents, if needed, to make a list of the spiritual 'weeds' that seem to be a problem in your own personal walk with the Lord. Put this list some place where you will see it often and make these 'weed' a serious matter of personal prayer. You and your family members may decide to share these lists which each other and pray for one another about this issue.
50. Study Galatians 6:6-8 to understand it as it relates to the life of a believer.
51. Read Luke 10:2 and think about the spiritual meaning of that sentence. What should be our reaction to it?
52. According to pastors and funeral directors, the hymn "In the Garden" is one of the most popular hymns requested for Christian funerals and/or memorial services. After listening to it, think about the words and discuss with your family why you think it is so popular. Would you like it sung at your funeral?

LANGUAGE ARTS

53. Find and learn about at least one type of plant that propagates by each of the methods listed in #12. Write a brief paragraph on each one. (E, S)
54. If you have never used a dictionary before, you will need to learn that skill to complete the activities in this unit study. You will be defining many words throughout this unit.
55. Start a vocabulary notebook to fill as you do this study. Using a spiral or loose-leaf notebook, label the pages with letters of the alphabet in order. If you are using a spiral notebook, allow more than one page for each of the common consonants. You will use this book to record all definitions assigned in these activities, writing and defining each word on the page of its initial letter. You may add other new words as you encounter them. (E)
56. Write an essay comparing and contrasting two or more of the propagation methods you have studied. (S, E)
57. Add the word 'dominion' to your vocabulary notebook and explain how the soil-building activities you are doing relate to having dominion over the soil. (B, E)
58. Write an essay explaining the responsibilities that we, as Adam's descendents, have today toward our physical world. (B, E, S)
59. In your vocabulary notebook, define the following words as they relate to preparing your garden spot: *aeration, bedding plants, cold frame, double-bedding, hot frame, irrigation, tilling*. (E)
60. Write a report of your field trip to the land grant college in the format that would be used for a newspaper article.
61. In your vocabulary notebook, define the following words related to plant reproduction: *bulb, cutting, germination, propagation, runners, sprouting, tuber*. (E)
62. Add the words: *accounting, asset, depreciation, and expenditure* to your vocabulary notebook. (E)
63. In your vocabulary notebook, define the following types of plants: *annual, biennial, deciduous, dicotyledon, monocotyledon, perennial, self-propagating*. Find out which of these categories covers each of your chosen plants. (S, E)

64. In your vocabulary notebook, define the following words related to soil nutrients and additives: acidic, alkaline, base, compost, fertilizer, herbicide, insecticide, mulch, peat, ph, topsoil. (E)
65. As you will be asked to write reviews of books, movies, and music as part of this unit study, now is a good time to learn how to do that. The best way to learn that skill is to read lots of reviews. You can find them in magazines and newspapers and at book, movie, and music websites on the Internet. Be sure you work with your parents' permission when doing this.
66. Add to your vocabulary notebook the following garden tools used for site preparation: *aerator, hoe, plow, shovel, spade, tiller (also called a rototiller), tractor, trowel*. (E)
67. Read *The Secret Garden* by Frances Hodgson Burnett (Parents, be aware that this book contains an element of "magic" that may be offensive to some. Feel free to substitute other books if you desire.) and write a critique of it as might be done by a book reviewer. (E)
68. Watch the 1993 movie of *The Secret Garden* starring Kate Maberly. and write a critique of it as might be done by a movie reviewer. (E)
69. Watch the Hallmark Hall of Fame movie (circa. 1990) of *The Secret Garden* and write a critique of it as might be done by a movie reviewer.
70. Write a contrast and compare essay showing the similarities and differences between the two movies and the book of *The Secret Garden*. (E)
71. Write a factual essay explaining why you three different accounts of the parable of the sower were included in the Bible. (B, E)
72. Drawing on the lessons for the parable of the sower, prepare a three-to-five page (or longer) instructional tract to help children who wish to share their faith prepare their hearers for the best possible reception. Use simple words, short pages, a large font and attractive illustrations.
73. Write an essay to answer the following questions from Matthew 13. How do people in God's church resemble the wheat and the tares? How can we tell if professing believers truly know the Lord? Is it our job to make that decision?
74. Write a story in which people in the church are faced with a "wheat or tares" type dilemma. Give your interpretation of how it should be handled by the church members and by the leadership.

75. Read the book *The Basket of Flowers* and write a traditional book report on it.
76. Rewrite the story of the vine and the branches from the perspective of the branches. Share how it feels to be part of the vine, how the branches feel about each other, how eager they are to please the vine grower (husbandman). Use your imagination to give the branches personality.
77. Write a letter to the Lord committing yourself to serving Him, asking His forgiveness when you don't and praising Him for being who He is and caring for us.
78. Write a poem about gardens and vineyards.
79. Write a poem in praise of the Lord for being the vine, the vineyard owner, and the gardener in our lives.
80. After discussing the fruit in your life with others who know you well, write a prayer thanking God for the fruit that is being exhibited and asking His guidance and strength in the other areas.
81. After examining all of the Bible's references relating salvation and Christian growth to a garden, write your own parable (or story if you prefer that term) using similar symbolisms in a different context. (E)
82. Read a biography of Gregor Mendel. (E, H)
83. Read a biography of Luther Burbank. (E, H)
84. Read a biography of George Washington Carver. (E, H)
85. Read the book *Square-Foot Gardening*.
86. Write a symbolic poem using plants or gardening terms to represent or describe something totally different.
87. Keep a running journal in your gardening log to share with others the story of your garden.
88. Write an essay on the Biblical sentence "You reap what you sow," discussing both the literal sense and the spiritual symbolism.

89. Study the type of poetry known as pastorals, and learn to recognize those that fall into that category.
90. Read a collection of pastoral poems (available in most public libraries) by John Donne or others of that time period.
91. Write a pastoral poem similar to the ones you have read.
92. Add the word 'pastoral' to your vocabulary notebook.
93. After reading and discussing Luke 10, write a help wanted ad that could be run in a fictitious newspaper to call Christians as laborers into the Spiritual harvest.
94. Put together a possible TV commercial on the same topic.
95. Write a brief devotional for younger children to explain what is mean by the phrase, "You reap what you sow."
96. Find and read the words to the old Christian hymn "In the Garden. Think about how it describes your relationship with the Lord and write a paragraph about the symbolism and meaning it has for you.
97. Write a review of any or all of the albums you listen to as part of this unit study. Be sure to include a short synopsis of each song as well as an overview of the entire collection.
98. Define each of the words found in the list of fruit in Galatians 5:22-23. If the dictionary gives more than one definition, use your judgment to choose the most appropriate one.

HISTORY AND RELATED SUBJECTS

99. Research the purposes of U. S. Agricultural Extension Service and their field employees, usually known as “county agents” and the duties they perform for the ‘ordinary’ farmer or gardener. (L, H)
100. Study the history and makeup of the U. S. Department of Agriculture of which the extension service is a part. Learn about the other sections of this agency and their responsibilities (H)
101. Study the history of the agricultural colleges/universities in each state that were once known as Land grant colleges. Discover how they got that name. (H)
102. Learn about the history of Victory Gardens, popular in the U. S. during WWII. Learn their purpose and how they helped the country? Prepare a TV or radio ad that might have been used during that time period to encourage people to grow Victory Gardens. (E, H, P)
103. Study the Hanging Gardens of Babylon to learn who planted them, when they were planted, and when and how they were destroyed. (H)
104. Study the life of Gregor Mendel, the father of plant genetics.
105. Study the life of Luther Burbank and his work with potatoes. (H, S)
106. Study the life of George Washington Carver and the history of his work with peanuts and sweet potatoes. (H)
107. Tour the homes or museums of any of the botanists listed here. (H)
108. Investigate oriental gardens and the symbolisms they use in them. Find out how some of these figure into the religions of the area. (H)
109. Locate on a map or online the site of the Garden of Gethsemane, where Jesus was betrayed. Find out what type garden it was and what grew there at that time and what (if anything) grows there now. (H)
110. Learn the history of garden tools by playing the game explained at www.howstuffworks.com/easy-gardening-activities-for-kids1.htm
111. Tour gardens of cacti and succulents grown in arid areas. (H, S)

VISUAL AND PERFORMING ARTS

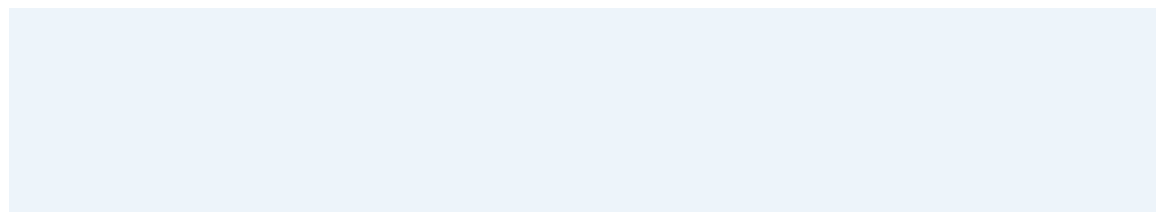
112. Once you have chosen a design for your garden, **sketch it** in your log book as you want it to look, designating which plants should go where. (A, E)
113. Draw a cartoon or mural to illustrate the parable of the sower. (A, B)
114. Using the e-book on that topic, design a bonsai tree from any suitable tree of plant you have on hand or can access easily. (A)
115. Use drawing, cutouts, stamps or fancy lettering to make small signs for labeling the plants in your garden. Fix each sign on a small stake or skewer to post at each row, bed, or mound, (A, L)
116. Draw and label a full color poster showing the parts of a flower, including a cross-section to show those on the inside. (A)
117. Get together with friends and/or siblings to perform and/or video tape the TV commercial you wrote advertising for laborers into the 'harvest' of souls for the Lord. (A, L)
118. Make a poster to illustrate Luke 10:2. (A, B)
119. Write and perform a puppet show or play on any topic you have studied on this unit. (A, E)
120. Listen to the songs on Kirk Whalum's album ***Hymns in the Garden*** and choose the ones you like best. **(A)**
121. If you are musically talented, learn to play or sing one or more of the songs on the album *Hymns in the Garden*. **(A)**
122. Use your musical talents to play and/or sing the hymn "In the Garden" (which is not on the above album). (A)

SCIENCE

123. For your first look at how plants 'breathe' play 'respiring plants' following instructions at www.howstuffworks.com/easy-gardening-activities-for-kids3.htm
124. Investigate each of the following types of plant reproduction and learn about how we can start each: *bulb, cutting, seed germination, propagation, runners, sprouting, tuber*. (S)
125. Find and study at least one example of each of the following types of plant reproduction and learn about how we can start each: *bulb, cutting, germination, propagation, runners, sprouting, tuber*. (S)
126. Study the various methods of sowing seeds: broadcasting, row planting and mounding, even if you are not using all of these in your garden. (S)
127. Prepare a display showing each type of plant reproduction that you will not be experiencing in your own garden. Follow each and see how it develops over time.
128. Take a field trip to the nearest agricultural land grant college where you can see them testing soil and adding nutrients to give it what the plants to be grown will need. Tour the test gardens and have the scientists there explain what they are doing. Be sure to ask any questions you might have. (S)
129. Following directions in any of the materials on the resource list with this unit or others at your disposal, map out preparation needed for your soil, taking into account what you learned about your particular soil through testing. (S)
130. Learn about nutritional (for the plants) and ecological benefits of composting and using composted matter in your garden.
131. Learn about the process of pollination and its importance in the growing of many types of flowers and crops.
132. Learn about all the parts of a flower and how each one functions for the health of the whole plant.
133. To have fun with your family and learn about pollination, play www.howstuffworks.com/easy-gardening-activities-for-kids4.htm . If you are not growing flowers and/or do not have a wide range of colors, try this game at a local botanical garden or flower nursery.

134. Using www.howstuffworks.com and other sources of your choice, investigate each of the tools you are using for your gardening. Find out how each works and all of its uses, in gardening and other areas. Compare and contrast those that could possibly be used for the same job to decide which you would use in each case. (L, S)
135. Look up each of the tools you have used at www.howstuffworks.com to learn how they are made so as best to perform the tasks for which we use them.
136. Study the wide variety of fruits and vegetables that grow on vines and find out which ones could be grown in your area and your soil.
137. Study the technology that made the Hanging Gardens of Babylon possible. See if you can duplicate it today. (H, S)
138. Study the work and discoveries of Gregor Mendel in plant genetics
139. Study the work of Luther Burbank and the advances it has made in the usefulness of potatoes. (H, S)
140. Study the peanut and the many uses found for it by George Washington Carver. (H, S)
141. Investigate Dr. Carver's work with sweet potatoes. (S)
142. Learn about crop rotation and how it benefits the soil. (S)
143. Examine the range of materials available to you for mulching. Study the pros and cons of each and determine which one you will use for your garden. (S)
144. Read Usborne's *Science with Plants* and do the experiments with your family. This is a good way for you to share gardening science with younger siblings.
145. Study various forms of irrigation and the materials available for it. (S)
146. Learn about environmentally friendly garden tools and those that are not by checking out www.cleanairgardening.com/gardentools.html

147. Once you have decided which fruits or vegetables to grow in your garden, research each of them to find the nutrients each will provide in your diet. Prepare a chart of some kind showing this information. (F, S)
148. Study the weather patterns in your area, especially with regard to temperature, wind, and precipitation. Use what you have learned to better prepare you for tending your garden throughout the growing season. (S)
149. Investigate organic gardening and learn how it is different. Prepare a chart or notebook showing the traditional and organic methods of pest control, soil preparation, and weed control. (S)
150. Study the environmental and health benefits of organic gardening. (S)
151. Learn about bees, butterflies and other insects that help pollenate flowering plants. (S)
152. Find ways to attract these helpful insects to your garden. (S)
153. Raise caterpillars and grow in a cage, terrarium, or large jar, Easy directions are at www.butterflyschool.org/teacher/raising. (S)
154. Visit an apiary and ask the beekeeper to teach you about his or her work. (L, S)
155. Learn about earthworms and other creatures that aid in aerating and preparing soil for a good garden. (S)
156. Play the game “Plant your Socks” as a fun way to learn more about other organisms that live in soil and dirt. See how at www.howstuffworks.com/easy-gardening-activities-for-kids9.htm
157. Study the effects on the body of stings from bees and other pollinating insects and the proper first aid measures to treat them. (F)



PRACTICAL SKILLS

158. Plant at least one plant that reproduces by each of the methods you have studied. The ones you don't intend to use in your garden can be planted in jars or pots and displayed as you see fit.
159. Learn to use all the tools you have studied for gardening. Be sure to work with an adult to avoid any danger.
160. Learn the safety rules for using all types of garden tools and practice using them safely.
161. Learn the proper way to care for each of the tools you will be using and be sure to do so at all times.
162. Build a scarecrow or other device to keep birds away from your plants. (A)
163. If you are growing vines, you will need to build a 'teepee', stack or trellis for them to climb. (L)
164. Begin now to collect plant and food scraps (no meat products) to make compost for next year's garden. (S)
165. Build a simple compost bin, following directions from the county extension office or found at www.ehow.com/how_2118627_compost-pile-backyard.html and use it to store your compost for the next gardening season. ((L, S)
166. Go online with your parents' permission and look up additional materials to study using the links in the e-book *Recommended Online Resources for Families* included in this packet. (I)
167. Use the computer to type any and all of your papers with your parents' permission. (I, L)
168. Learn to prepare at least one nutritious dish using each of the fruits and vegetables you grew in your garden. (F, L)
169. Apply the nutritional information you have learned about the produce you have grown to prepare a full meal from only those items that will allow your family to get as much of their required vitamins and minerals as possible. (F, L)

170. Use books on food storage, suitable websites, or materials available from the county extension office to learn how to preserve your surplus produce through canning. You will need to work with an adult and be very careful. (F, L)
171. Learn how to make jams, jellies and/or preserves from any appropriate produce if you wish. Work closely with an adult and follow all safety rules for high temperatures. (L)
172. Study cookbooks and other resources to find low sugar alternatives to traditional jams, jellies and preserves. (F)
173. Work with an adult to preserve some of your produce through the process of dehydration (drying). (L)
174. If you do not have a dehydrator, make your own following directions at www.ehow.com/how_2217792_simple-food-dehydrator.html. (L, S)
175. Get an adult to work with you in preparing some of your produce for storage in your freezer. You may want to try several different methods to do this. (L)
176. Study the healthy storage life of each type of fruit or vegetable you plan to store in each different method. Label each container with appropriate 'use by' dates and be sure to follow them. (F, L)
177. If you produced more from your garden than your family will use, arrange to sell the extra at a roadside stand or your local farmers' market. Check the prices others are charging for the same produce and set your prices to be competitive, but be sure you can cover the expenses of the booth or stand and any advertising or other expenses you might encounter. Keep good accounts for this purpose. (L, M)
178. Once you have completed your harvest for the year, you need to clear and prepare your plot for next season. Follow directions in any of the gardening books you have used or materials from the county extension service. (F, L, S)

MATHEMATICS

179. Before you go any further in your planning, set up a ledger or chart to log what you spend on your garden. This can be done in a designated section of your garden logbook, an actual financial ledger, or a computer program such as Excel or Access. Enter all expenses as you accumulate them, beginning with the cost of this kit, and keep a running total. Keep this chart and continue to add to it throughout this project. At the end of the project you will know how much you have spent and can determine if the project was worth the cost. (I, M)
180. If you buy tools or other things for this project that can be used for other things later, you will need to adjust your expenses by determining the depreciation of each item. Use the instructions found at <http://www.businesstown.com/accounting/basic-depreciation.asp> to do that.(M)
181. Using a tape measure with both types of units on it, compile data and make the computations to find the formula for converting from metric to standard and vice versa. (M)
182. Using the actual dimensions of your garden plot, draw a scale model of your planned garden, being careful to measure each section so you can be sure the plan will fit the space. (A, M)
183. Once you have measured each of the sides of your proposed garden, use those figures and the appropriate formulas to find the area of the garden. If your garden is not in a regular geometric shape, you will have to divide it into two or more to do this activity. (M)
184. Once you have measured each of the sides of your proposed garden, use those figures and the appropriate formulas to find the area of the garden. If your garden is not in a regular geometric shape, you will have to divide it into two or more to do this activity. (M)
185. Using the information on your seed packages, determine how many seeds of each plant you should put in each hole, row, or mound and about how many plants of each kind you will produce. Record that information on your accounting chart now for later use. (M)
186. Compute the percentage of your garden spot's area is taken up by each type of plant. (M)
187. Compute the percentage of each type plant you are growing based on the actual number of each plant. Note and explain any difference between these figures and the set above. (M)

188. Express the numbers in the two previous activities in decimal and common fractions. Reduce fractions to lowest terms. (M)
189. Prepare a pie graph showing the information on the above graph as percentages. (M)
190. Prepare a line graph to be used throughout this project to track the temperature in your area so you can be aware of any special needs for your garden due to temperature extremes. (M)
191. In the parable of the sower, Jesus said that some seed produced one hundred, sixty or thirty times what was sown. Compute how much of each plant each of those would be based on the number of seeds of each you planted. (M)
192. Make the same computation based on the weight of each item you planted. (M)
193. When you plants have been harvested, weigh and measure each type of produce and see how the harvest compared to your projections in the above activity. (M)
194. When you gather your harvest, measure how much (bushel, quart, etc.) of each crop you gather. Be sure to do this each time you harvest anything. Compile all of those numbers to find the total you have harvested. Divide the total volume of your harvested crops with the total volume of the seeds you planted to see if your seeds gave a return similar to that in the parable of the sower. (M)
195. Calculate the percentage of return by volume that you go on each of your plant types. (M)
196. Learn the volume of various units of dry measure used in harvesting produce. Be sure to include: bushel, peck, gallon, quart, and others you may use. (M)
197. Weigh all the vegetables or fruit you harvest and record the amount of each in your log. (M)

198. Using local grocery ads or prices from grocery store shelves or the local farmers' market, find and record the price per pound for each type of produce you grew. Multiply each by the number of pounds you harvested to find the value of the crops you grew. Add them together for the total income from your garden. Record that in your ledger. (M)
199. Perform the necessary calculations with your expense and income figures to determine the loss or profit you made on your gardening venture. (M)
200. Add any profit you may have realized from selling your produce to the previous figures to determine the final profit or loss you realized from your garden. (M)
201. Determine the percentage of increase you made in terms of cost. (M)