

Appendix

A2

Bible Action Truths
Bible Promises
Explaining the Gospel

A7

Materials List

A17

Standards

The BJU Press science materials are developed after reviewing many standards, including the National Science Education Standards (NSES). The Science Content Standards section of the NSES groups the criteria based on grade levels K–4, 5–8, and 9–12.

The table provides an overview of the areas in which *SCIENCE 6* aligns with the NSES Science Content Standards for grades 5–8. An *X* indicates that at least one component of the standard is addressed in the chapter.

The topics listed in the table are interpreted and discussed in *SCIENCE 6* text according to a Christian worldview.

A19

Index

A24

Photo Credits

A28

How to Use the Teacher's Toolkit

Bible Action Truths

The quality and consistency of a man's decisions reflect his character. Christian character begins with justification, but it grows throughout the lifelong process of sanctification. God's grace is sufficient for the task, and a major part of God's gracious provision is His Word. The Bible provides the very "words of life" that instruct us in salvation and Christian living. By obeying God's commands and making godly decisions based on His Word, Christians can strengthen their character.

Too often Christians live by only vague guidance—for instance, that we should "do good" to all men. While doing good is desirable, more specific guidance will lead to more consistent decisions.

Consistent decisions are made when man acts on Bible principles—or Bible Action Truths. The thirty-seven Bible Action Truths (listed under eight general principles) provide Christians with specific goals for their actions and attitudes. Study the Scriptures indicated for a fuller understanding of the principles in Bible Action Truths.

Thousands have found this format helpful in identifying and applying principles of behavior. Yet, there is no "magic" in this formula. As you study the Word, you likely will find other truths that speak to you. The key for you is to study the Scriptures, look for Bible Action Truths, and be sensitive to the leading of the Holy Spirit.

1. Salvation-Separation Principle

Salvation results from God's direct action. Although man is unable to work for this "gift of God," the Christian's reaction to salvation should be to separate himself from the world unto God.

- a. **Understanding Jesus Christ** (Matthew 3:17; 16:16; 1 Corinthians 15:3–4; Philippians 2:9–11) Jesus is the Son of God. He was sent to Earth to die on the cross for our sins. He was buried but rose from the dead after three days.
- b. **Repentance and faith** (Luke 13:3; Isaiah 55:7; Acts 5:30–31; Hebrews 11:6; Acts 16:31) If we believe that Jesus died for our sins, we can accept Him as our Savior. We must be sorry for our sins, turn from them, confess them to God, and believe that He will forgive us.
- c. **Separation from the world** (John 17:6, 11, 14, 18; 2 Corinthians 6:14–18; 1 John 2:15–16; James 4:4; Romans 16:17–18; 2 John 10–11) After we are saved, we should live a different life. We should try to be like Christ and not live like those who are unsaved.

2. Sonship-Servant Principle

Only by an act of God the Father could sinful man become a son of God. As a son of God, however, the Christian must realize that he has been "bought with a price"; he is now Christ's servant.

- a. **Authority** (Romans 13:1–7; 1 Peter 2:13–19; 1 Timothy 6:1–5; Hebrews 13:17; Matthew 22:21; 1 Thessalonians 5:12–13) We should respect, honor, and obey those in authority over us. (attentiveness, obedience)

Bible Action Truths and Bible Promises are included as a resource. They provide specific goals for actions and attitudes and include Bible references for further study in identifying and applying principles of behavior.

- b. **Servanthood** (Philippians 2:7–8; Ephesians 6:5–8) Just as Christ was a humble servant while He was on Earth, we should also be humble and obedient. (attentiveness, helpfulness, promptness, teamwork)
- c. **Faithfulness** (1 Corinthians 4:2; Matthew 25:23; Luke 9:62) We should do our work so that God and others can depend on us. (endurance, responsibility)
- d. **Goal setting** (Proverbs 13:12, 19; Philippians 3:13; Colossians 3:2; 1 Corinthians 9:24) To be faithful servants, we must set goals for our work. We should look forward to finishing a job and going on to something more. (dedication, determination, perseverance)
- e. **Work** (Ephesians 4:28; 2 Thessalonians 3:10–12) God never honors a lazy servant. He wants us to be busy and dependable workers. (cooperativeness, diligence, initiative, industriousness, thoroughness)
- f. **Enthusiasm** (Colossians 3:23; Romans 12:11) We should do all tasks with energy and with a happy, willing spirit. (cheerfulness)

3. Uniqueness-Unity Principle

No one is a mere person; God has created each individual a unique being. But because God has an overall plan for His creation, each unique member must contribute to the unity of the entire body.

- a. **Self-concept** (Psalms 8:3–8; 139; 2 Corinthians 5:17; Ephesians 2:10; 4:1–3, 11–13; 2 Peter 1:10) We are special creatures in God's plan. He has given each of us special abilities to use in our lives for Him.
- b. **Mind** (Philippians 2:5; 4:8; 2 Corinthians 10:5; Proverbs 23:7; Luke 6:45; Proverbs 4:23; Romans 7:23, 25; Daniel 1:8; James 1:8) We should give our hearts and minds to God. What we do and say really begins in our minds. We should try to think of ourselves humbly as Christ did when He lived on Earth. (orderliness)
- c. **Emotional control** (Galatians 5:24; Proverbs 16:32; 25:28; 2 Timothy 1:7; Acts 20:24) With the help of God and the power of the Holy Spirit, we should have control over our feelings. We must be careful not to act out of anger. (flexibility, self-control)
- d. **Body as a temple** (1 Corinthians 3:16–17; 6:19–20) We should remember that our bodies are the dwelling place of God's Holy Spirit. We should keep ourselves pure, honest, and dedicated to God's will.
- e. **Unity of Christ and the church** (John 17:21; Ephesians 2:19–22; 5:23–32; 2 Thessalonians 3:6, 14–15) Since we are saved, we are now part of God's family and should unite ourselves with others to worship and grow as Christians. Christ is the head of His church, which includes all believers. He wants us to work together as His church in carrying out His plans, but He forbids us to work in fellowship with disobedient brethren.

4. Holiness-Habit Principle

Believers are declared holy as a result of Christ's finished action on the cross. Daily holiness of life, however, comes from forming godly habits. A Christian must consciously establish godly patterns of action; he must develop habits of holiness.

- a. **Sowing and reaping** (Galatians 6:7–8; Hosea 8:7; Matthew 6:1–8) We must remember that we will be rewarded according to the kind of work we have done. If we are faithful, we will be rewarded. If we are unfaithful, we will not be rewarded. We cannot fool God. (thriftiness)
- b. **Purity** (1 Thessalonians 4:1–7; 1 Peter 1:22) We should try to live lives that are free from sin. We should keep our minds, words, and deeds clean and pure.
- c. **Honesty** (2 Corinthians 8:21; Romans 12:17; Proverbs 16:8; Ephesians 4:25) We should not lie. We should be honest in every way. Even if we could gain more by being dishonest, we should still be honest. God sees all things. (fairness)
- d. **Victory** (1 Corinthians 10:13; Romans 8:37; 1 John 5:4; John 16:33; 1 Corinthians 15:57–58) If we constantly try to be pure, honest, and Christlike, with God's help we will be able to overcome temptations.

5. Love-Life Principle

We love God because He first loved us. God's action of manifesting His love to us through His Son demonstrates the truth that love must be exercised. Since God acted in love toward us, believers must act likewise by showing godly love to others.

- a. **Love** (1 John 3:11, 16–18; 4:7–21; Ephesians 5:2; 1 Corinthians 13; John 15:17) God's love to us was the greatest love possible. We should, in turn, show our love for others by our words and actions. (courtesy, compassion, hospitality, kindness, thankfulness to men, thoughtfulness)
- b. **Giving** (2 Corinthians 9:6–8; Proverbs 3:9–10; Luke 6:38) We should give cheerfully to God the first part of all we earn. We should also give to others unselfishly. (hospitality, generosity, sharing, unselfishness)
- c. **Evangelism and missions** (Psalm 126:5–6; Matthew 28:18–20; Romans 1:16–17; 2 Corinthians 5:11–21) We should be busy telling others about the love of God and His plan of salvation. We should share in the work of foreign missionaries by our giving and prayers.
- d. **Communication** (Ephesians 4:22–29; Colossians 4:6; James 3:2–13; Isaiah 50:4) We should have control of our tongues so that we will not say things displeasing to God. We should encourage others and be kind and helpful in what we say.
- e. **Friendliness** (Proverbs 18:24; 17:17; Psalm 119:63) We should be friendly to others, and we should be loyal to those who love and serve God. (loyalty)

6. Communion-Consecration Principle

Because sin separates man from God, any communion between man and God must be achieved by God's direct action of removing sin. Once communion is established, the believer's reaction should be to maintain a consciousness of this fellowship by living a consecrated life.

- a. **Bible study** (1 Peter 2:2–3; 2 Timothy 2:15; Psalm 119) To grow as Christians, we must spend time with God daily by reading His Word. (reverence for the Bible)
- b. **Prayer** (1 Chronicles 16:11; 1 Thessalonians 5:17; John 15:7, 16; 16:24; Psalm 145:18; Romans 8:26–27) We should bring all our requests to God, trusting Him to answer them in His own way.
- c. **Spirit-filled** (Ephesians 5:18–19; Galatians 5:16, 22–23; Romans 8:13–14; 1 John 1:7–9) We should let the Holy Spirit rule in our hearts and show us what to say and do. We should not say and do just what we want to, for those things are often wrong and harmful to others. (gentleness, joyfulness, patience)
- d. **Clear conscience** (1 Timothy 1:19; Acts 24:16) To be good Christians, we cannot have wrong acts, thoughts or words bothering our consciences. We must confess them to God and to those people against whom we have sinned. We cannot live lives close to God if we have guilty consciences.
- e. **Forgiveness** (Ephesians 4:30–32; Luke 17:3–4; Colossians 3:13; Matthew 18:15–17; Mark 11:25–26) We must ask forgiveness of God when we have done wrong. Just as God forgives our sins freely, we should forgive others when they do wrong things to us.

7. Grace-Gratitude Principle

Grace is unmerited favor. Man does not deserve God's grace. However, after God bestows His grace, believers should react with an overflow of gratitude.

- a. **Grace** (1 Corinthians 15:10; Ephesians 2:8–9) Without God's grace we would be sinners on our way to hell. He loved us when we did not deserve His love and provided for us a way to escape sin's punishment by the death of His Son on the cross.
- b. **Exaltation of Christ** (Colossians 1:12–21; Ephesians 1:17–23; Philippians 2:9–11; Galatians 6:14; Hebrews 1:2–3; John 1:1–4, 14; 5:23) We should realize and remember at all times the power, holiness, majesty, and perfection of Christ, and we should give Him the praise and glory for everything that is accomplished through us.
- c. **Praise** (Psalm 107:8; Hebrews 13:15; 1 Peter 2:9; Ephesians 1:6; 1 Chronicles 16:23–36; 29:11–13) Remembering God's great love and goodness toward us, we should continually praise His name. (thankfulness to God)
- d. **Contentment** (Philippians 4:11; 1 Timothy 6:6–8; Psalm 77:3; Proverbs 15:16; Hebrews 13:5) Money, houses, cars, and all things on Earth will last only for a little while. God has given us just what He meant for us to have. We should be happy and content with what we have, knowing that God will provide for us all that we need. We should also be happy wherever God places us.
- e. **Humility** (1 Peter 5:5–6; Philippians 2:3–4) We should not be proud and boastful but should be willing to be quiet and in the background. Our reward will come from God on Judgment Day, and men's praise to us here on Earth will not matter at all. Christ was humble when He lived on Earth, and we should be like Him.

8. Power-Prevailing Principle

Believers can prevail only as God gives the power. “I can do all things through Christ” (Phil. 4:13). God is the source of our power used in fighting the good fight of faith.

- a. **Faith in God’s promises** (2 Peter 1:4; Philippians 4:6; Romans 4:16–21; 1 Thessalonians 5:18; Romans 8:28; 1 Peter 5:7; Hebrews 3:18; 4:11) God always remains true to His promises. Believing that He will keep all the promises in His Word, we should be determined fighters for Him.
- b. **Faith in the power of the Word of God** (Hebrews 4:12; Jeremiah 23:29; Psalm 119; 1 Peter 1:23–25) God’s Word is powerful and endures forever. All other things will

pass away, but God’s Word shall never pass away because it is written to us from God, and God is eternal.

- c. **Fight** (Ephesians 6:11–17; 2 Timothy 4:7–8; 1 Timothy 6:12; 1 Peter 5:8–9) God does not have any use for lazy or cowardly fighters. We must work and fight against sin, using the Word of God as our weapon against the Devil. What we do for God now will determine how much He will reward us in heaven.
- d. **Courage** (1 Chronicles 28:20; Joshua 1:9; Hebrews 13:6; Ephesians 3:11–12; Acts 4:13, 31) God has promised us that He will not forsake us; therefore, we should not be afraid to speak out against sin. We should remember that we are armed with God’s strength.

Bible Promises

A. Liberty from Sin—Born into God’s spiritual kingdom, a Christian is enabled to live right and gain victory over sin through faith in Christ. (Romans 8:3–4—“For what the law could not do, in that it was weak through the flesh, God sending his own Son in the likeness of sinful flesh, and for sin, condemned sin in the flesh: that the righteousness of the law might be fulfilled in us, who walk not after the flesh, but after the Spirit.”)

B. Guiltless by the Blood—Cleansed by the blood of Christ, the Christian is pardoned from the guilt of his sins. He does not have to brood or fret over his past because the Lord has declared him righteous. (Romans 8:33—“Who shall lay any thing to the charge of God’s elect? It is God that justifieth.” Isaiah 45:24—“Surely, shall one say, in the Lord have I righteousness and strength: even to him shall men come; and all that are incensed against him shall be ashamed.”)

C. Basis for Prayer—Knowing that his righteousness comes entirely from Christ and not from himself, the Christian is free to plead the blood of Christ and to come before God in prayer at any time. (Romans 5:1–2—“Therefore being justified by faith, we have peace with God through our Lord Jesus Christ: by whom also we have access by faith into this grace wherein we stand, and rejoice in hope of the glory of God.”)

D. Identified in Christ—The Christian has the assurance that God sees him as a son of God, perfectly united with Christ. He also knows that he has access to the strength and the grace of Christ in his daily living. (Galatians 2:20—“I am crucified with Christ: nevertheless I live; yet not I, but Christ liveth in me: and the life which I now live in the flesh I live by the faith of the Son of God, who loved me, and gave himself for me.” Ephesians 1:3—“Blessed be the God and Father of our Lord Jesus Christ, who hath blessed us with all spiritual blessings in heavenly places in Christ.”)

E. Christ as Sacrifice—Christ was a willing sacrifice for the sins of the world. His blood covers every sin of the believer and pardons the Christian for eternity. The purpose of His death and Resurrection was to redeem a people to Himself. (Isaiah 53:4–5—“Surely he hath borne our griefs, and carried our sorrows: yet we did esteem him stricken, smitten of God, and

afflicted. But he was wounded for our transgressions, he was bruised for our iniquities: the chastisement of our peace was upon him; and with his stripes we are healed.” John 10:27–28—“My sheep hear my voice, and I know them, and they follow me: and I give unto them eternal life; and they shall never perish, neither shall any man pluck them out of my hand.”)

F. Christ as Intercessor—Having pardoned them through His blood, Christ performs the office of High Priest in praying for His people. (Hebrews 7:25—“Wherefore he is able also to save them to the uttermost that come unto God by him, seeing he ever liveth to make intercession for them.” John 17:20—“Neither pray I for these alone, but for them also which shall believe on me through their word.”)

G. Christ as Friend—In giving salvation to the believer, Christ enters a personal, loving relationship with the Christian that cannot be ended. This relationship is understood and enjoyed on the believer’s part through fellowship with the Lord through Bible reading and prayer. (Isaiah 54:5—“For thy Maker is thine husband; the Lord of hosts is his name; and thy Redeemer the Holy One of Israel; The God of the whole earth shall he be called.” Romans 8:38–39—“For I am persuaded, that neither death, nor life, nor angels, nor principalities, nor powers, nor things present, nor things to come, nor height, nor depth, nor any other creature, shall be able to separate us from the love of God, which is in Christ Jesus our Lord.”)

H. God as Father—God has appointed Himself to be responsible for the well-being of the Christian. He both protects and nourishes the believer, and it was from Him that salvation originated. (Isaiah 54:17—“No weapon that is formed against thee shall prosper; and every tongue that shall rise against thee in judgment thou shalt condemn. This is the heritage of the servants of the Lord, and their righteousness is of me, saith the Lord.” Psalm 103:13—“Like as a father pitieth his children, so the Lord pitieth them that fear him.”)

I. God as Master—God is sovereign over all creation. He orders the lives of His people for His glory and their good. (Romans 8:28—“And we know that all things work together for good to them that love God, to them who are the called according to his purpose.”)

Explaining the Gospel

One of the greatest desires of Christian teachers is to lead children to the Savior. God has called you to present the gospel to your students so that they may repent and trust Christ, thereby being acceptable to God through Christ.

Relying on the Holy Spirit, you should take advantage of the opportunities that arise during lessons for presenting the good news of Jesus Christ. Ask questions to personally apply the Ten Commandments to your students (e.g., What is sin? Have you ever (name sin)? Are you a sinner?). You may also ask questions to discern the child's sincerity or any misunderstanding he might have (e.g., What is the gospel? What does it mean to repent? Can you do anything to save yourself?). Read verses from your Bible. You may find the following outline helpful, especially when dealing individually with a child.

1. I have sinned (Romans 3:23).

- Sin is disobeying God's Word (1 John 3:4). I break the Ten Commandments (Exodus 20:2–17) by loving other people or things more than I love God, worshiping other things or people, using God's name lightly, disobeying and dishonoring my parents, lying, stealing, cheating, thinking harmful and sinful thoughts, or wanting something that belongs to somebody else.
- Therefore, I am a sinner (Psalm 51:5, 58:3; Jeremiah 17:9).
- God is holy and must punish me for my sin (Isaiah 6:3; Romans 6:23).
- God hates sin, and there is nothing that I can do to get rid of my sin by myself (Titus 3:5; Romans 3:20, 28). I cannot make myself become a good person.

2. Jesus died for me (Romans 5:8).

- God loves me even though I am a sinner.
- He sent His Son, Jesus Christ, to die on the cross for me. Christ is sinless and did not deserve death. Because of His love for me, Christ took my sin on Himself and was punished in my place (1 Peter 2:24a; 1 Corinthians 15:3; John 1:29).
- God accepted Christ's death as the perfect substitution for the punishment of my sin (2 Corinthians 5:21).
- Three days later, God raised Jesus from the dead. Jesus is alive today and offers salvation to all. This is the gospel of Jesus Christ: He died on the cross for our sins according to the Scriptures, and He rose again the third day according to the Scriptures (1 Corinthians 15:1–4; 2 Peter 3:9; 1 Timothy 2:4).

3. I need to put my trust in Jesus (Romans 10:9–10, 13–14a).

- I must repent (turn away from my sin) and trust only Jesus Christ for salvation (Mark 1:15).
- If I repent and believe in what Jesus has done, I am putting my trust in Jesus.
- Everyone who trusts in Jesus is forgiven of sin (Acts 2:21) and will live forever with God (John 3:16). I am given His righteousness and become a new creation, with Christ living in me (2 Corinthians 5:21; Colossians 1:27).

If a child shows genuine interest and readiness, ask, “Are you ready to put your trust in Jesus and depend on only Christ for salvation?” If he says yes, then ask him to talk to God about this. Perhaps he will pray something like the following:

God, I know that I've sinned against You and that You hate sin, but that You also love me. I believe that Jesus died to pay for my sin and that He rose from the dead, so I put my trust in Jesus to forgive me and give me a home with You forever. In Jesus' name I pray. Amen.

Show the child how to know from God's Word that he is forgiven and in God's family (1 John 5:12–13; John 3:18). Encourage him to follow Jesus by obeying Him each day. Tell him that whenever he sins, he will be forgiven as soon as he confesses those sins to God (1 John 1:9).

Materials List

Standard Science Supplies

balance	meter stick	protractor	thermometer
calculator	metric beakers	spring scale	
goggles	metric measuring cups	stopwatch	
magnifying glass	metric measuring spoons	timer	

Basic Supplies

buckets	containers	glue	scissors
colored pencils	crayons	newspaper	tape
construction paper	dishpan	paper towels	water

Materials by Chapter

Materials marked with **X** are used only for enrichment demonstrations and activities.

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
aerosol can	X														
aluminum foil		X						X		X	X				
ammonia					X		X								
antacids, 4 commercial varieties							X								
apple or orange slices with seeds												X			
apple or potato slices					X										
appliances, several small								X							
bag of candy									X						
bag, black plastic			X								X				
bag, plastic sandwich		X							X	X					
bags, resealable		X			X		X								
baking soda	X						X								
balance		X	X							X					
ball, basketball											X				
ball, golf										X					
ball, rubber										X					
ball, soccer											X				
ball, softball											X				
ball, table tennis										X					
balloons				X			X			X	X				
batteries, C- or D-cell								X							
batteries, various sizes								X							

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
battery, 6-volt								X							
BBs									X		X				
bead, small											X				
blindfold														X	
blocks, toy					X				X						
board, 30 cm × 80 cm									X						
Borax							X								
bottle, 500 mL clear plastic		X					X								
bottle or container, small	X														
box, cardboard											X				
buckets		X	X		X										X
Bunsen burner										X					
butter		X													
calculator						X			X						
can, empty soup		X													
can, soft drink										X					
candle and candle holder										X				X	
card stock										X	X				
cardboard, stiff	X									X					
cardboard tubes			X	X	X				X						
carnation, white						X									
carrot tops												X			
checkers			X				X								
cheesecloth		X	X		X										
chocolate milk mix										X					
clay, dry		X													
clay, modeling	X	X		X											
clothespin, spring											X				
coins								X	X						
colored pencils					X		X	X		X					
compass, drawing													X		
cones, conifer, assorted male and female												X			
container, large							X					X			
containers, clear plastic													X		

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
containers, cylindrical			X												
containers, plastic with snap-on lids		X													
cooking oil			X												
cooking spray		X													
copper, small piece								X							
cotton balls			X												
cotton swabs					X										
craft sticks											X				
crayons		X											X		
crayon sharpener		X													
crispy rice cereal		X													
cups, clear plastic, any size			X		X		X	X	X			X	X		
cups, clear plastic 12 oz		X	X												
cups, clear plastic 9 oz		X													
cups, foam, any size	X										X			X	X
cups, foam 12 or 16 oz		X													
dehydrated food											X				
detergent, liquid													X		
dishpan, deep					X					X					
dish soap, liquid			X												
droppers, medicine or eye	X		X				X								X
earthworm					X										
eggs, raw														X	
electric fan			X												
electromagnet from appliance								X							
electronic devices, small											X				
eraser, chalkboard									X						X
fabric		X													
family tree													X		
fern						X									
fettuccine noodles, dry	X														
field guide, plants						X									
field guide, trees						X									
file folder							X								

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
fish bowl, glass					X									X	
fishing line											X				
flashlight					X					X	X				
flour										X	X				X
flower, large												X			
flower or plant that has died			X												
flower pots													X		
flowering plants (marigold or petunia)													X		
foam balls							X			X					
foam block, 20 cm × 25 cm	X														
food coloring			X			X									
freezer		X													
fruits, assorted dry and fleshy												X			
funnel	X														
gallon jug or pitcher			X												
glitter															X
globe											X				
gloves, latex															X
glue, white							X				X		X		
goggles, safety	X	X	X				X			X					X
grasshopper or picture of grasshopper					X										
grass tufts			X												
gravel													X		
hammer			X							X					
helmet, protective											X			X	
hot plate	X	X	X												
hydrogen peroxide, 3%							X								
ice		X			X										
ice cube tray		X													
insulators, various								X							
iron, electric		X													
iron filings								X							
jar, large-mouth glass		X			X										
jars, plastic with twist-on lids														X	

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
keys, assorted														X	
knife, small												X			
labels, blank										X					
lamp, 3-way, unshaded										X					
lamp, unshaded					X					X	X				
leaves, dried					X										
leaves, fresh			X												
lemon juice							X								
lenses, concave and convex										X					
level, carpenter's	X														
levers, assorted									X						
light bulb, 3-way										X					
light bulb, 40-watt										X					
light bulbs with sockets								X							
lights, Christmas tree								X							
litmus paper, red and blue							X								
magnet, horseshoe								X							
magnets, bar			X		X			X							
magnets, disk-shaped								X							
magnifying glass				X	X					X		X			
map, blank world															X
map, road													X		
map, world	X	X	X		X					X					
marble, large											X				
marble, small											X				
marker, permanent										X					
marshmallows, large	X	X		X							X				
matches										X					
mealworms					X										
measuring cups, metric	X	X			X		X								
measuring tape										X					
measuring wheel											X				
meat tenderizer													X		
metals, various			X					X							

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
meter stick		X			X				X	X	X				
microscope				X											
microscope slides, prepared				X											
milk							X								
mirror					X										
model car				X											
model 3-stage rocket (optional)											X				
mushroom cap												X			
nail, common, 6d										X					
nail, finishing (small)		X								X					
needle with large eye										X					
newspaper										X	X				
note card									X	X					X
notepad, plastic cover					X										
oatmeal or wheat bran					X										
overhead projector (optional)										X					
overhead transparency					X			X							
padlock with key						X								X	
paint											X				
paintbrushes											X				
pan, foil baking (9" × 13")			X												
pan, foil baking, small		X	X												
pan, foil loaf		X													
pan, saucepan, large	X	X													
paper				X			X								
paper clips, large metal								X			X				
paper fasteners											X				
paper hole punches		X													
paper towels			X			X		X			X				
paper, black					X			X		X	X	X			
paper, blue construction													X		
paper, graph										X					
paper, green construction													X		
paper, orange construction													X		

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
paper, unlined					X										
paper, white				X	X					X	X	X			
paper, yellow construction													X		
pasta, various, uncooked				X											
peas, dry											X				
pebbles			X		X										
pen										X					
pencil sharpener, battery or electric				X											
pennies	X								X		X				
pH indicator paper							X								
pH meter							X								
picture of a bison				X											
picture of a car				X											
picture of a flying gecko or flying squirrel					X										
picture of a hang glider					X										
picture of a jellyfish					X										
picture of a mole					X										
picture of a mountain lion				X											
picture of a mountain range										X					
picture of a porcupine					X										
picture of a rhinoceros					X										
picture of a sea star					X										
picture of a snail					X										
picture of a swan or duck					X										
picture of a whale					X										
picture of a woodpecker					X										
picture of an octopus					X										
picture of the solar system											X				
picture of the Statue of Liberty						X									
pictures of flowers						X									
pictures of the Grand Canyon		X													
pictures of various plants						X									
pictures of Yellowstone National Park	X														
pictures, various calendar			X												

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
pie plate, foil											X				
pie plate (glass)	X			X											
pinwheel			X												
plastic lacing															X
plastic wrap											X				
pony beads, assorted colors															X
posterboard, assorted colors														X	
posterboard, black														X	
posterboard, white														X	
posterboard, white or colored							X								
potato chips (2 different brands)														X	
potato with sprouts												X			
potting soil		X	X		X							X			
power bill, electric								X							
prism										X					
protractor		X	X								X				
pulley									X						
quilt batting					X										
raw wheat germ													X		
red cabbage juice							X								X
resources about animals					X										
resources about diseases and discoveries															X
resources about planets											X				
resources about plants						X									
resources about roller coasters									X						
rocks, assorted small		X													
rocks, igneous	X														
rope			X												
rubber bands		X			X				X	X	X				
rubber spatula					X										
rubbing alcohol													X		
ruler (centimeter and inch)		X		X	X	X			X	X	X	X	X	X	
salt			X				X	X							
sand		X			X						X				

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
scissors, heavy duty		X	X								X				
scissors, school													X	X	
seed catalogs or seed packets		X				X									
seed, mustard											X				
seeds, carrot												X			
seeds, lima bean												X			
seeds, poppy											X				
self-stick white dots										X					
shoebox								X							
shortening, solid					X										
simple machines, various									X						
snail					X										
sodium hydroxide or lye mixture solution															X
soft drinks (2 different brands)														X	
soil samples		X													
sponge, manmade	X				X										
sponge, natural					X										
spoon, large		X													
spoons			X												
spray bottle		X													
spring scale									X						
spring toy	X														
staples, bar of								X							
star charts										X					
sticks (twigs)	X		X		X	X									
stirring sticks							X								
stopwatch or clock with second hand		X	X		X		X				X			X	
straw, drinking											X				
string	X					X			X		X				
suction cups					X										
sugar		X		X											
sunglasses											X				
sunscreen											X				
tape, clear					X						X			X	

Materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
tape, electrical								X							
tape, masking					X				X	X	X				
tape measure						X				X					
tea containing ginkgo						X									
tea kettle			X												
thermometers					X		X								
thread spool, empty									X						
thread, spools of									X	X					
tongs		X													
toothpick					X							X	X	X	
toy animal or doll				X											
toy car									X						
trail mix							X								
travel brochures											X				
tubing, flexible clear plastic									X						
umbrella, dark										X					
vinegar	X				X		X	X							
vise		X													
voltmeter								X							
water	X	X	X	X	X	X	X	X				X	X	X	
water, distilled							X								X
watering can or large salt shaker		X	X												
waxed paper		X													
wire, insulated								X							
wire screen					X										
wood, small pieces		X													
yeast				X			X								

National Science Education Content Standards

BJU Press *SCIENCE 6* alignment with NSES Science Content Standards for grades 5–8

Chapter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Science as Inquiry															
Abilities necessary to do scientific inquiry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Understandings about scientific inquiry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Physical Science															
Properties and changes of properties in matter							X								
Motions and forces									X						
Transfer of energy			X					X	X						
Life Science															
Structure and function in living things				X	X	X						X	X	X	X
Reproduction and heredity				X								X	X		
Regulation and behavior				X											
Populations and ecosystems					X	X									
Diversity and adaptations of organisms				X	X	X									
Earth and Space Science															
Structure of the earth system	X	X	X												
Earth's history	X		X												
Earth in the solar system											X				
Science and Technology															
Abilities of technological design	X	X	X				X	X	X		X		X		X
Understandings about science and technology	X	X	X	X			X	X	X		X		X		X
Science in Personal and Social Perspectives															
Personal health			X											X	X
Populations, resources, and environments			X												
Natural hazards	X	X	X												
Risks and benefits	X	X													
Science and technology in society	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
History and Nature of Science															
Science as a human endeavor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nature of science	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
History of science	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Unifying Concepts and Processes															
Systems, order, and organization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Evidence, models, and explanation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Change, constancy, and measurement	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Evolution* and equilibrium	X		X	X	X	X	X			X	X	X			
Form and function	X			X	X	X	X	X	X	X	X	X	X	X	X

* Evolution is presented as a theory to be critically examined from a Christian worldview.

Index

A

abortion, 332
 abrasion, 34–35
 acceleration, 232–33, 236
 acid rain, 36–37
 Activity lessons
 A Science Experiment, 14–15
 An “Unbreakable” Circuit, 210–11
 Blubber Mitts, 148–49
 Build an Electromagnet, 220–21
 Cell Model, 104
 Classification Check, 166
 Classifying, 108
 Clean Up the Spill, 66–67
 Construction Site, 16–17
 Crater Creations, 278–79
 Create an Eruption, 22–23
 Defend and Capture, 414
 Erosion Prevention, 76–77
 Flower Dissection, 322–23
 Hot or Cold, 194–95
 How Big Is My Tree?, 172–73
 How Much Force?, 248–49
 It’s a Race!, 336–37
 It’s All in the Genes, 342
 Mealworm Movement, 132–33
 Measuring Rocks, 40–41
 Minicars in Motion, 238–39
 Of Epidemic Proportions, 404–5
 Paper Pet Genetics, 354–55
 pH indicator, 200–201
 Pinhole Constellations, 268
 Reaction Time, 376–77
 Retaining the Right Amount, 46–47
 Rocket Race, 288–89
 Spare Parts Solar Oven, 302–3
 Stream Erosion, 52–53
 Touch Tester, 382–83
 Which Antacid Is Best?, 202–3
 adrenal glands, 389
 agents of erosion, 48, 57
 AIDS, 409
 alchemy, 180
 Aldrin, Edwin “Buzz,” 300
 algae, 110–11, 153
 allergen, 412
 allergic reaction, 412
 Alzheimer’s disease, 390
 amnesia, 385
 amoeba, 110, 334
 ampere, 213
 amphibian, 136–37, 330–31
 angiosperm, 158, 162–65, 318
 annelid, 126–27
 annual, 162–63
 antibiotic, 411
 antibody, 408–9, 410, 408–11
 aquifer, 80–81
 Aristarchus, 281
 Armstrong, Neil, 300
 arthropod, 128–31
 arachnid, 129
 centipede, 129
 crustacean, 128–29
 insect, 130–31, 319, 400–401
 millipede, 129
 ash, 18–21, 25, 64
 asterism, 268
 asteroid, 274, 294
 astrology, 265
 astronomy, 265
 Aswan High Dam, 50–51
 atom, 180–93, 206–8
 atomic bonds, 192–93
 atomic mass, 181, 185
 atomic number, 182, 185
 atomic theory, 183
 atomic weight, 185
 electron, 181, 186–87, 192–93, 206–9,
 214–15
 nucleus, 181–83, 186–87
 proton, 181–82, 185, 193, 206
 shell, 181, 186, 192–93
 aurora, 291
 autoimmune disease, 413
 autonomic nervous system, 374
 autonomous underwater vehicle, 86–87
 avalanche, 49
 axon, 372–73, 390

B

Babbage, Charles, 226
 bacteria, 109–10, 334, 398, 408–9, 411
 Barringer Crater, 274–75
 Barringer, Daniel, 275
 bats, 144, 291
 battery, 214–15
 bedrock, 44, 56
 Bernard, Dr. Christian, 413
 biennial, 162–63
 bilateral symmetry, 126
 binary fission, 334
 binary number system, 224–25
 binary star system, 270–71
 bird, 140–41, 330
 bivalve, 120
 black hole, 262–63
 block and tackle, 244
 blubber, 146, 148–49
 Bohr, Niels, 182
 brain, 368–73, 375, 378–91
 brain stem, 369–70
 Braun, Wernher von, 282
 budding, 334

C

cambium, 168–69
 carbonic acid, 36–37
 Carlsbad Caverns, 38
 carnivore, 139, 145–46
 cave, 38–39
 cell, 97–107, 112–13
 membrane, 102
 neuron, 372–73, 375
 nucleus, 102
 organelle, 102–3
 parts of, 102–3
 reproduction, 106–7
 sickle cell, 356
 theory, 97
 white blood cell, 407–13
 central nervous system, 368–71
 cerebellum, 337–38
 cerebrospinal fluid, 368, 371
 cerebrum, 369–70
 chemistry, 180
 acid, 196–203
 alkali, 196
 antacid, 196, 199, 202–3
 base, 196–203
 chemical change, 189, 191
 chemical formula, 190
 compound, 189–93
 covalent bond, 192
 indicator, 198, 200–203
 ion, 193
 ionic bond, 193
 metalloid, 186–87
 noble gases, 192
 periodic table of the elements, 185–88
 pH scale, 197–201
 reaction, 191, 194–95, 214
 symbol, 184
 chemosynthesis, 93
 Chernobyl, 71
 chlorophyll, 103, 112

chloroplast, 103, 112
 chromosome, 102, 328, 340–43, 348, 353, 357–59
 cilia, 110, 406
 circuit
 closed, 208, 224–25
 integrated, 224
 open, 208, 224–25
 parallel, 212
 series, 212
 short, 208
 classification
 animal, 118–47
 cells and organisms, 108–15
 elements, 185–87
 plant, 154–71
 clay, 42–44, 55
 club mosses, 157
 coal, 62, 64, 68
 cochlear implants, 378
 codominance, 348–49
 cold-blooded, 134–39
 Collins, Michael, 300
 comet, 275
 communicable disease, 397
 computer, 225–27
 conifer, 158–61, 324–25
 conservation, 74–75
 constellation, 262, 264–65, 268–69, 271
 contour plowing, 75
 corona, 290–91
 cotyledon, 164–65, 321
 crater, 18, 274, 278–79
 Crick, Francis, 343
 cross-pollination, 319
 crude oil, 62–63
 cystic fibrosis, 357
 cytologist, 104

D

Dalton, John, 182
 da Vinci, Leonardo, 229
 debris flow, 24–25
 deflation, 54–55
 delta, 51
 dendrite, 372–73
 deposition, 48, 50
 depressants, 392
 dicotyledon, 164–65
 distance, 231
 distillation tower, 63
 DNA, 102, 339–40, 343–45
 dominant gene, 348–53
 dominant trait, 347–49, 352–53
 double helix, 343
 Down syndrome, 357

drug abuse, 391–94
 dust storm, 55
 dwarf planet, 295, 307

E

ear, 378
 Earth, 6–7, 32–33, 292–93, 298–99
 earth flow, 48–49
 earthquake, 8–17
 epicenter, 10–11
 fault, 8–9
 focus, 10
 magnitude, 12
 echinoderm, 125
 echolocation, 144, 146
 eclipse, 301
 Edison, Thomas, 206, 209
 effort force, 242–44
 eggs, 330
 electricity, 206–227
 battery, 214–15
 conductor, 208–9
 current electricity, 208–9
 electric cell, 214
 electrolyte, 214–15
 electromagnet, 217–18, 220–21
 insulator, 208–9, 225
 measurements of, 213
 static electricity, 206–7
 electroencephalograph (EEG), 387
 element, 180, 184–91
 embryo, 320–21, 328–30
 endocrine glands, 388–89
 endothermic reaction, 194–95
 energy, 62–65, 68–71, 96
 epidemic, 400–405
 epidemiologist, 402–405
 epilepsy, 390
 equinox, 292–93
 erosion, 48–57, 74–77
 euthanasia, 332
 Ewing, Ella, 389
 exfoliation, 34
 exoskeleton, 128
 exothermic reaction, 194–95
 Exploration lessons
 A Different Look, 269
 An Organized Cell, 105
 Animal Robotics, 150–51
 DNA Extraction, 345
 Drug Abuse, 392–93
 Extra, Extra, Read All About It!, 415
 Famous Inventors, 219
 I.N.V.E.N.T., 27
 Plant Products, 167
 Roller Coaster, 240

Snail Terrarium, 124
 Soil Detective, 45
 Solar Walk, 308–9
 Stargazing, 276–77
 Travel Brochure, 310–11
 Wanted: U or Your Element, 188
 Water in Israel, 84–85
 eye, 379

F

fallow, 74
 Faraday, Michael, 216
 faults
 normal, 8–9
 reverse, 8
 strike-slip, 9
 fern, 157, 326
 fertilization, 319, 328
 fiber optics, 122–23
 fibrous roots, 170–71
 fiddlehead, 157
 filter feeder, 125, 135
 fish
 bony, 135
 cartilage, 134
 eggs, 330–31
 Fleming, Alexander, 413
 floodplain, 51
 flower, parts of, 318–320
 force, 233–249
 fossil fuel, 62–64
 fragmentation, 334
 Franklin, Benjamin, 206–7
 Franklin, Rosalind, 343
 friction, 209, 233, 235, 246–47
 Fritz, Charles, 71
 frond, 157, 326
 fruit, 320
 fruiting body, 327
 fulcrum, 242–43
 fungi, 111, 327, 398, 411

G

galaxy, 272–73
 Galilei, Galileo, 234, 266
 Galvani, Luigi, 205
 gene, 340–59
 generator, 218
 genetic engineering, 358–59
 genetics, 340–61
 genotype, 348–49
 geothermal energy, 69
 germinate, 321
 gestation, 329
 geyser, 26
 glacier, 56–57

Goddard, Robert, 282
GPS, 75
gravity, 48–49, 230, 234–35, 285, 298
Great Barrier Reef, 119
ground cover, 75
ground water, 80
group, 186
gymnosperm, 158–161, 324

H

hallucinogens, 392–93
heliculture, 121
hemophilia, 353
Henry, Joseph, 216
herbaceous, 169
herbivore, 138
heredity, 340–57
Hipparchus, 257
hippocampus, 385
Hooke, Robert, 97–98
horizons, soil, 44
hormones, 388–89
hornworts, 154
horsetail, 156
host, 126
hot spot, 19
hot spring, 26
Hubble Space Telescope, 266, 284
humidity, 81
humus, 42–44
Huntington's disease, 357, 402
hybrid, 346–351
hydrochloric acid, 196, 406
hydroelectric energy, 68
hydrosphere, 78
hypothalamus, 388–89

I

iceberg, 82
ice sheet, 82
ice shelf, 82
igneous rock, 25, 32–33
immune response, 406–9
immunity, 410
impulse, 372–75
incomplete dominance, 349
incomplete metamorphosis, 130
indicator, 198
inertia, 234–35
inflammatory response, 407
inflatable spacecraft, 286–287
inhalents, 393
insectivore, 143
insects, 130–33, 319, 400
insulator, 209, 225
integrated circuit, 224
International Astronomical Union, 294

invertebrate, 118–33
ion, 193
ionic bond, 193

J

Jansen, Zacharias, 98
joule, 241

K

Kilby, Jack, 224
kinetic energy, 230
kingdom, 109–115
 Kingdom Animalia, 113, 118–51
 Kingdom Archaeobacteria, 110
 Kingdom Eubacteria, 109
 Kingdom Fungi, 111
 Kingdom Plantae, 112, 154–73
 Kingdom Protista, 110–11
Kuiper Belt, 294–95, 307

L

larva, 131–33
Latimer, Lewis, 209
lava, 18, 20–21, 24–25
laws of motion, 234–39
Leeuwenhoek, Anton van, 98
life cycle, 94
 amphibian, 136
 conifer, 325
 fern, 326
 insects, 130–131
life span, 94
light-year, 259
Linnaeus, Carolus, 114
lithosphere, 6, 18
liverwort, 155
load, 50
loam, 42, 43
lobe, 369
Lowell, Percival, 297
lunar eclipse, 301
Lyme disease, 128
lymphatic system, 407

M

machine
 compound, 247
 inclined plane, 246, 248–49
 lever, 242–43
 pulley, 244
 screw, 247
 simple, 242–47
 wedge, 246
 wheel and axle, 245
maglev train, 222–23
magma, 9, 18–19, 25, 32–33

magma chamber, 18
magnet, 216–18
magnetic field, 216–18
magnitude
 of stars, 257
 of earthquakes, 12
mammal, 142–47
 bat, 144, 319
 hoofed mammal, 144
 marine mammals, 146
 marsupial, 143, 329
 mole, 143
 monotreme, 142
 pinniped, 145–46
 primate, 147
 rabbit, 143
 rodent, 143
mass movement, 49
mealworm, 132–33
mechanical advantage, 244, 246
mechanical energy, 230
meiosis, 107, 340
memory
 long-term, 384, 85
 short-term, 385
memory cell, 408–10
Mendel, Gregor Johann, 346–50
Mendeleev, Dmitri, 185
metal, 72–73
metallic bonds, 192
metamorphic rock, 32–33
metamorphosis, 130–31, 136
meteor, 274
meteorite, 274
meteoroid, 274
microscope, 97–98
millipede, 129
mineral, 72
mitosis, 106, 328, 343
molecule, 189
mollusk, 120–21
molt, 128
momentum, 233
monocotyledon, 164–65
moon, 298–301
moraine, 57
moss, 154–55, 327
motion, 230, 324–239
mudflow, 48–49
mud pot, 26
multicellular organism, 101
multiple sclerosis, 390, 413
multiple star group, 270
myelin sheath, 372–73

N

natural gas, 64
natural resource, 62–83
nebula, 261
nematocyst, 118–19
nervous system, 343–70
neuron, 372–81
neutral, 197, 206–7
neutralize, 199
Newton, Sir Isaac, 234, 236–39, 266
Nightingale, Florence, 396
nocturnal, 144
noncommunicable disease, 402
nonrenewable resource, 62–65
nonvascular plant, 154–55
Noyce, Robert, 224
nuclear energy, 65
nymph, 130

O

Oersted, Hans Christian, 216
omnivore, 138
ore, 72
organ, 101, 412–13
organism, 94
oxidation, 36

P

pancreas, 389
Pangaea, 7
paramecium, 110
parasite, 126
Parkinson's disease, 390
particle accelerator, 183
passive immunity, 410
Pasteur, Louis, 396–97, 390
pathogen, 397–414
pedigree, 352
pedologist, 42, 45
perennial, 163
period, 186
peripheral nervous system, 372–74
petrochemical, 63
petroleum, 62–63
phenotype, 348–50
phloem, 168
photosynthesis, 103, 112, 138
phrenology, 367
phytoplankton, 78–79
pituitary gland, 389
planet
 dwarf, 295, 307
 gas giant, 294
 inner, 294–99
 Jupiter, 294–95, 304

Mars, 284, 294–95, 297
Mercury, 294–95, 296
Neptune, 294–95, 306
outer, 294–95
Pluto, 294–95, 307
Saturn, 294–95, 305
terrestrial, 294
Uranus, 294–95, 305
Venus, 294–95, 296–97

plate boundary, 7–8

plucking, 56–57

poliovirus, 400–401

pollination, 319, 324–25

Pompeii, 19, 24

potential energy, 230

precious metal, 72–73

pressure release, 34

primary root, 170

probe, 284

Process Skills

 classifying, 108, 166

 collecting and recording data, 149, 195,
 279, 342

 communicating, 104

 defining operationally, 249

 experimenting, 14–15, 211, 239

 hypothesizing, 14–15, 203, 288

 identifying and controlling variables,
 14–15, 17, 377

 inferring, 77, 303, 405

 making and using models, 23, 67, 268,
 355

 measuring and using numbers, 40–41,
 53, 173, 323

 observing, 133, 201, 337

 predicting, 47, 221, 383

protozoan, 110–111, 398

Punnett, Reginald, 350

Punnett square, 350–51, 354–55

pupa, 131

purebred, 346–50

Q

Queen Victoria, 353

quillworts, 156

R

radial symmetry, 125

radio telescope, 267

recessive gene, 348–53

recessive trait, 347–49, 352–53

recycling, 83

Redi, Francesco, 317

redshift, 267

reference point, 230

refinery, 62–63

reflecting telescope, 266

reflex, 375

refracting telescope, 266

regeneration, 334

regolith, 44

REM sleep, 386–87

renewable energy resource, 68–71

renewable resource, 68–71, 74–82

reproduction

 asexual reproduction, 334–35

 fertilization, 319, 328

 gestation, 329

 placental mammal, 329

 sexual reproduction, 107, 319

 vegetative reproduction, 283

 zygote, 319–21, 325–26, 328

reptile, 138–39, 330–31

reservoir, 68–69

resistance force, 242

resistor, 209

revolution, 292

rhizoid, 139

rhizome, 157

Richter scale, 12

Ring of Fire, 18–19

robotic surgery, 414–15

rock cycle, 32–33

rocket, 237, 282–83, 288–89

rockslide, 49

roots, 170–71

rotation, 292

S

salt, 199

sand, 42–43

sandstorm, 55

SARS, 402

satellite, 284, 286–87, 298

sea ice, 82

seasons, 292–93

sediment, 48–51, 54–57

sedimentary rock, 32–33

seed, 158, 164–65, 320–21, 324–25

seedless vascular plant, 156–57

seismic wave, 10–13

seismologist, 10–11

self-pollination, 319

semi-conductor, 225

Semmelweis, Dr. Ignaz, 397

senses, 378–81

setae, 127

sickle cell anemia, 356

silicon, 224

silt, 42–43

smelting, 72–73

Snow, John, 403
 soil, 42–47, 74–75
 soil creep, 49
 soil horizon, 44
 solar energy, 70–71
 solstice, 292–93
 somatic nervous system, 374
 space exploration
 Apollo 11, 300
 Apollo 13, 283, 302
 Cassini, 305
 Challenger, 283
 Columbia, 283
 Curiosity, 297
 Galileo, 304
 Hubble Space Telescope, 266, 284
 inflatable habitat, 286–87
 International Space Station, 283, 285
 Magellan, 297
 Mariner 4, 297
 Mariner 12, 296
 Mars Climate Orbiter, 284
 NASA, 286
 New Horizons, 284, 307
 Opportunity, 297
 Project Apollo, 300
 rockets, 237, 282–83, 288–89
 solar sails, 287
 space shuttle, 283
 Spirit, 297
 Sputnik I, 284
 Venera, 297
 Voyagers 1 and 2, 284, 305–6
 spectroscopy, 267
 spelunker, 38
 spinal column, 371
 spinal cord, 368, 371, 375
 sponge, 118, 122–23
 spore, 326–27
 stalactite, 38–39
 stalagmite, 38–39
 stars
 circumpolar constellation, 264
 cluster, 271
 constellation, 264, 268–69, 271
 dwarf, 258–59
 giant, 258–59
 magnitude, 257
 nebula, 261
 neutron, 262–63
 nova, 261
 pulsar, 263
 supergiant, 258–59
 supernova, 262
 variable, 260

stem, 168–69
 stimulants, 392–93
 Stratton, Charles (Tom Thumb), 389
 Study Skills
 graphic organizers, 28–29
 PQ3R, 58–59
 Sturgeon, William, 217
 subsoil, 44
 sun
 faculae, 290–91
 parts of the, 290
 seasons, 292–93
 solar eclipse, 301
 solar energy, 70–71
 solar flare, 290–91
 solar prominence, 290–91
 solar storm, 291
 solar wind, 291
 sunspot, 291
 switch, 208
 synapse, 373

T

taproot, 170–71
 technology, 102
 Technology lessons
 A Useful Weed, 360–61
 Autonomous Underwater Vehicles, 86–87
 Fiber Optic Sponges, 122–23
 Inflatable Spacecraft, 286–87
 Magnetic Levitation, 222–23
 Robotic Surgery, 414–15
 telescope, 266–67
 tephra, 20
 texture, 42–43, 45
 texture triangle, 43
 theory of plate tectonics, 6–7
 Thomson, J. J., 182
 thyroid gland, 389
 tissue, 101
 topsoil, 44
 totality, 301
 trait, 340–42, 346–55
 transfusion, 412
 tsunamis, 13
 tuber, 169

U

unicellular, 101
 Unifomitarianism, 32
 univalve, 120
 uranium, 65

V

vaccine, 410
 vacuole, 103
 variable star, 260
 vascular plant, 156–71
 vascular system, 168
 vector, 400–401
 vein, 72
 velocity, 232–33
 vent, 18
 vertebrate, 118, 134–47
 virus, 399
 volcano
 eruption, 21, 26
 products of, 25
 pyroclastic flow, 21
 shape of, 20
 vog, 24–25
 volcanologist, 18
 volt, 213, 215, 373
 Volta, Alessandro, 205

W

Wadlow, Robert, 389
 warm-blooded, 141
 water cycle, 78–79
 Watson, James, 343
 watt, 213
 weathering
 chemical, 33, 36–39
 mechanical, 33–35
 Welles, Orson, 297
 white blood cells, 407–13
 White, Jim, 38
 Wilkins, Maurice, 343
 wind energy, 70
 work, 241–49
 worm
 flatworm, 126
 roundworm, 126
 segmented, 126–27

X

xylem, 168

Z

zygote, 319–21, 325–26, 328

Photo Credits

These page numbers refer to the Student Text.

The following agencies and individuals have furnished materials to meet the photographic needs of this textbook. We wish to express our gratitude to them for their important contribution.

3dCafe.com
123RF
Aaregistry.org
Alamy
Richard A. Altizer
Suzanne Altizer
American Leprosy Missions
Archives at Queens Library
J. Ramon Arrowsmith
ASSOCIATED PRESS
Philip Baird
Tom Barnes
BJU Photo Services
Bureau of Reclamation
Cedar Fair L.P./Cedar Point
Centers for Disease Control
Comstock
Corbis
COREL Corporation
Dr. Tom Coss
Dr. Stewart Custer
Guillaume Dargaud
Terry Davenport
David Malin Images
Department of Energy
Department of Natural Resources
Digital Vision
Dreamstime
Edgar Fahs Smith Collection University of Pennsylvania Libraries
Egyptian Tourist Authority
European Southern Observatory (ESO)
Donna Fare
Forestry Images
Fotolia
Getty Images
Philip Greenspun
Hemera Technologies, Inc.
Holiday Film
iStockphoto
Intuitive Surgical, Inc.
Brian Johnson
Kansas Geological Survey
Breck Kent
Joyce Landis
Sam Laterza
Library of Congress
Kerrie Anne Lloyd
Luray Caverns
Ron Magill
Meteor Crater
NASA
National Library of Medicine
National Mining Association
National Oceanic and Atmospheric Administration (NOAA)
Craig Oesterling
OHAUS
Susan Perry
PhotoDisc, Inc.
Richmond Products

David Robbins
Bruce Roberts
Paul Roberts
Wendy Searles
Shutterstock
South Carolina Highway Patrol
Stem Labs, Inc.
SuperStock
The Telegraph
Thinkstock
Transrapid International GmbH & Co. KG
University of Washington
USC Wrigley Institute for Environmental Studies
United States Department of Agriculture (USDA)
USDA Forest Service
United States Geological Survey (USGS)
U.S. Naval Observatory
Visuals Unlimited
Ward's Natural Science Establishment, Inc.
Wikimedia Commons
Norbert Wu

Cover:

© iStockphoto.com/ranplett (background); © iStockphoto.com/Bill Noll (graph paper); © iStockphoto.com/samxmeg(photoframes); © iStockphoto.com/Logan Dance (map); © iStockphoto.com/MauMyHaT (salamander); Getty Images/iStockphoto/Thinkstock (leaf); © iStockphoto.com/stockcam (pebble); iStockphoto/Thinkstock (sky); Craig Oesterling (bug); Getty Images/Comstock Images/Thinkstock (starfish); © iStockphoto.com/spx-Chrome (sand dollar)

Unit Openers

© iStockphoto.com/Bill Noll (background for all unit openers, chapter openers, activity, technology and exploration sections)

© iStockphoto.com/samxmeg (photo frames for all unit and chapter openers)

Unit 1

USGS 1 (top left); © iStockphoto.com/Dan Sam 1 (top right); Joyce Landis 1 (bottom)

Unit 2

© iStockphoto.com/MistikaS 77 (top left); © iStockphoto.com/spxChrome 77 (top right); Getty Images/iStockphoto/Thinkstock 77 (bottom left and right)

Unit 3

© Blend Images/SuperStock 159 (top); Jupiterimages/liquidlibrary/Thinkstock 159 (bottom); © Ivan Cholakov/Dreamstime.com 159 (bottom inset)

Unit 4

Getty Images/iStockphoto/Thinkstock 233 (top); Getty Images/Stocktrek/Thinkstock 233 (bottom)

Unit 5

© iStockphoto.com/Pixhook 287 (top); © age fotostock/SuperStock 287 (center); Tony Metaxas/Asia Images/Getty Images 287 (bottom)

Unit 6

Getty Images/iStockphoto/Thinkstock 333 (left); © iStockphoto.com/kizilkayaphotos/© iStockphoto.com/lazun 333 (top right); Yorgos Nikas/Stone/Getty Images 333 (bottom right)

Chapter 1

© Visions of America, LLC/Alamy 3; © Philip Baird/www.anthroarcheart.org 6 (top); "PikiWiki Israel 5980 Great Rift Valley" by Ita Tsener/ "PikiWiki Israel 5980 Great Rift Valley" by Ita Tsener/ Wikimedia Commons CC-BY-2.5 Commons CC 2.5 6 (bottom); J. Ramon Arrowsmith 7; Paul Roberts 9; PhotoDisc, Inc. 11, 16 (bottom), 20; BJU Photo Services 13, 18, 19, 21 (center), 21 (bottom); "I didn't have time, Pompeii" by Daniele Florio/Wikimedia Commons/CC-BY-2.0 15; USGS 16 (top); U.S. Geological Survey 16 (center); Susan Perry 21 (top); "Boiling lake in Yellowstone National Park" by Mila Zinkova/Wikimedia Commons/CC-BY-SA 3.0/GFDL 22 (top left); Jupiterimages/Photos.com/Thinkstock 22 (top right); Getty Images/iStockphoto/Thinkstock 22 (bottom); NASA 23

Chapter 2

© iStockphoto.com/Kimberly Deprey 25; BJU Photo Services 27 (top and bottom), 39, 44, 45, 48 (top); PhotoDisc, Inc. 27 (center), 28 (bottom), 30, 31 (bottom), 40 (bottom and bottom right), 46 (bottom); 47 (top); Kerrie Anne Lloyd 28 (top); John Charlton, Kansas Geological Survey, University of Kansas 29, 40 (top right), 48 (bottom); Brian Johnson 31 (top); "Lichen (kevincollins)" by Kevin Collins/Wikimedia Commons/CC-BY-2.0 31 (center); Holiday Film 32; Luray Caverns 33; Ward's Natural Science Establishment Inc. 40 (center right); Egyptian Tourist Authority 42 (top); Getty Images/iStockphoto/Thinkstock 42 (bottom), 47 (bottom); NASA 43 (both); Bruce Roberts 46 (top); USDA Forest Service 49

Chapter 3

Getty Images/AbleStock.com/Thinkstock 51; Digital Vision 52, 63 (top right); PhotoDisc, Inc. 53, 62 (both), 73; National Mining Association 54 (all); Getty Images/Hemera/Thinkstock 55; BJU Photo Services 56, 63 (top left, center left), 67; Bureau of Reclamation 58; Department of Energy 59; © Robert Ruggiero/Dreamstime.com 60; Getty Images/iStockphoto/Thinkstock 61; Wendy Searles 63(center right, bottom); Medioimages/Photodisc/Thinkstock 64; USDA 65 (top); Department of Natural Resources 65 (bottom); David A. Caron, Wrigley Institute for Environmental Studies, University of Southern California 69 (both); Ryan McVay/Photodisc/Thinkstock 71; NOAA 72; Image courtesy of AUVfest 2008: Partnership Runs Deep, Navy/NOAA, OceanExplorer.noaa.gov 74; "Asub calanus" by Stifyn Tonna/Wikimedia Commons/CC-BY-SA 3.0 75 (top); University of Washington 75 (bottom)

Chapter 4

V Grave Eric/Photo Researchers/Getty Images 79; Getty Images/iStockphoto/Thinkstock 80 (left); PhotoDisc, Inc. 80 (right), 81 (bottom), 94 (bottom left), 96 (top), 96 (center), 97 (top and bottom); Jack Hollingsworth/Photodisc/Thinkstock 81 (top); “Cork Micrographia Hooke” by Robert Hooke/Wikimedia Commons/US Public Domain 83; “Hooke Microscope”/Alan Hawk/Wikimedia Commons/Public Domain 84; © Luk Cox - Fotolia.com 86; BJU Photo Services 92 (all), 94 (center right); “Staphylococcus aureus VISA 2” by Janice Haney Carr/Wikimedia Commons/Public Domain USGov-HHS-CDC 93; Dr. Tom Coss 94 (top right); George R. Collins/BJU Photo Services 94 (bottom right); Susan Perry 95 (top); Richard A. Altizer 95 (bottom); © iStockphoto.com/Karl Dolenc 96 (bottom); Getty Images/Hemera/Thinkstock 97 (center); Corbis 98

Chapter 5

© Corbis Premium RF/Alamy 101; PhotoDisc, Inc. 104, 118, 119 (both), 124, 125 (bottom left and center), 127 (top), 128 (both), 129 (top and center); 130 (both), 131 (bottom); © Minden Pictures/SuperStock 105, 125 (top); © 2012 Norbert Wu/www.norbertwu.com 106, 107 (bottom); Getty Images/Goodshoot/Thinkstock 107 (top); Getty Images/Comstock Images/Thinkstock 109; BJU Photo Services 110 (top), 116 (both), 117, 132, 133; Ward’s Natural Science Establishment, Inc. 110 (bottom); Breck Kent 111, 123 (top), 126 (bottom); Corbis 113; Digital Vision 120, 122 (top); Getty Images/Photos.com/Thinkstock 121 (top); © iStockphoto.com/Melinda Fawyer 121 (bottom); Ron Magill 122 (bottom); Getty Images/iStockphoto/Thinkstock 123 (bottom); © 2003 Hemera Technologies, Inc., All Rights Reserved 125 (bottom right); © iStockphoto.com/Nicolas Schleheck 126 (top); Terry Davenport 127 (bottom); Guillaume Dargaud 129 (bottom); Philip Greenspun 131 (top); © Beverly Speed/Dreamstime.com 134

Chapter 6

Getty Images/iStockphoto/Thinkstock 137; Suzanne Altizer 138, 139, 146 (bottom center); © J.S.Peterson@plants.usda.gov 140 (left); Tom Barnes University of Kentucky 140 (right); USDA Forest Service 141 (top); Dave Powell, USDA Forest Service, Bugwood.org 141 (bottom); © Minden Pictures/SuperStock 142 (top); Donna Fare 142 (bottom, bottom inset); “Redwood light”/National Park Service/Wikimedia Commons/Public Domain 143; Bill Cook, Michigan State University, Bugwood.org 144 (top left), 144–45 (bottom); Dave Powell, USDA Forest Service, Bugwood.org 144 (top center and right); Paul Wray, Iowa State University, Bugwood.org 144 (bottom inset); Dr. Stewart Custer 145 (top left); “Abies alba Beskid Żywiecki 4” by Crusier/Wikimedia Commons/CC By-SA-3.0 GNUFDL 145 (top right); “Abies alba” by Vassil/Wikimedia Commons/Public Domain 145 (top right inset); PhotoDisc, Inc. 146 (top, bottom left, bottom center left, bottom center right; bottom right), 147 (top right, bottom left), 148, 149 (all), 151 (bottom right), 152–53 (bottom), 153 (both), 154 (left); BJU Photo Services 147 (top right inset, bottom right), 154 (center and right); Susan Perry 151 (top); © Hemera Technologies, Inc. All Rights Reserved 151 (bottom left and center); Jupiterimages/Photos.com/Thinkstock 155

Chapter 7

© BSIP/SuperStock 161; Edgar Fahs Smith Collection University of Pennsylvania Libraries 164; Department of Energy 165; PhotoDisc, Inc. 166; BJU Photo Services 171 (left), 177, 181 (both), 183, 185; Susan Perry 171 (center and right), 180 (right); © Lastdays1/Dreamstime.com 179; © Joyce Michaud/Dreamstime.com 180 (left); © iStockphoto.com/Oksana Struk 180 (center)

Chapter 8

Getty Images/iStockphoto/Thinkstock 187, 206 (top right), 208 (bottom); © SuperStock/SuperStock 188; BJU Photo Services 191 (top left and right), 192, 193, 195 (left), 198 (all), 203 (both); Archives at Queens Library, Latimer Family Papers 191 (bottom); © Daltonartworks - Fotolia.com 195 (right); www.aaregistry.org 201 (left); ASSOCIATED PRESS 201 (center); © Everett Collection Inc./Alamy 201 (right); © Fritz Stoiber/Transrapid International GmbH & Co. KG 204; © F1 ONLINE/SuperStock 205; Hemera/Thinkstock 206 (top left); © iStockphoto.com/mozcann 206 (bottom); © Minden Pictures/SuperStock 207; Getty Images/Hemera/Thinkstock 208 (top left and right)

Chapter 9

© Yadid Levy/Alamy 211; Photo Disc, Inc. 212, 217 (both), 220; © Visual&Written SL/Alamy 213 (top); Susan Perry 213 (bottom), 224, 227 (top left and right); 229 (bottom); Getty Images/iStockphoto/Thinkstock 219 (top); © Kathy Libby/123RF 219 (bottom); Courtesy South Carolina Highway Patrol 221; Cedar Fair L.P./Cedar Point 222; OHAUS 223; © macumazahn - Fotolia.com 227 (bottom); BJU Photo Services 229 (top and center), 231

Chapter 10

Baback Tafreshi/Photo Researchers/Getty Images 235; NASA 236 (top), 237 (all), 241, 243 (top), 246, 250, 251 (both), 254 (top), 255 (top); Photo Disc, Inc. 236–37 (background); ESO 242; BH LMC by Alain r/Wikimedia Commons/CC-BY-SA 2.5 243 (bottom); Getty Images/Hemera/Thinkstock 247; Wendy Searles 248; Australian Astronomical Observatory/David Malin Images 252–53 (top), 253 (right); U.S. Naval Observatory 252 (center); Getty Images/Stocktrek/Thinkstock 252 (bottom); Meteor Crater, Northern Arizona, USA 254–55 (bottom); BJU Photo Services 257 (both)

Chapter 11

Getty Images/Hemera/Thinkstock 259; NASA 260, 261, 263, 265 (bottom), 268, 272 (all), 273 (all), 274 (both), 275 (top), 276 (bottom), 277, 278 (bottom), 282 (top), 282–83 (bottom), 283 (top), 284–85 (top), 284 (bottom); Getty Images/Purestock/Thinkstock 262; NASA-LaRC 264; “Bigelow Aerospace facilities”/NASA/Bill Ingalls/Wikimedia Commons/Public Domain 265 (top); BJU Photo Services 267, 280–81; © iStockphoto.com/Arild Heitmann 269; NASA/JPL-Caltech 275 (top inset); PhotoDisc, Inc. 276 (top); COREL Corporation 278 (top); Getty Images/iStockphoto/Thinkstock 279 (top); © iStockphoto.com/Rob Sylvan 279 (bottom); NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute 285 (bottom)

Chapter 12

Getty Images/Photos.com/Thinkstock 289; Getty Images/Hemera/Thinkstock 291 (top left), 300 (bottom); Getty Images/iStockphoto/Thinkstock

291 (top right); Merlin Tuttle/Photo Researchers/Getty Images 291 (bottom); BJU Photo Services 294, 295, 305 (top left and right, center, bottom left), 306, 307; © 2003 Hemera Technologies Inc. All rights reserved 296 (top and inset); Erich G. Vallery, USDA Forest Service - SRS-4552, Bugwood.org/CC-BY-3.0 296 (bottom); Susan Perry 299;

© Science Faction/SuperStock 299 (inset); PhotoDisc, Inc. 300 (top), 302 (center); © Sergey Lavrentev/Dreamstime.com 301 (top); Breck Kent 301 (bottom), 302 (bottom); © iStockphoto.com/Sven Peter 302 (top); M I WALKER/Photo Researchers/Getty Images 304 (top left); © NHPA/SuperStock 304 (top right); Ward’s Natural Science Establishment 304 (bottom left); © age fotostock/SuperStock 304 (bottom right); Sam Laterza/BJU Press Files 305 (bottom right)

Chapter 13

© age fotostock/SuperStock 309; © iStockphoto.com/digitalskillet 310; BJU Photo Services 311 (all); Courtesy of Jenifer Glynn/National Library of Medicine 313 (left); Source - Science/Photo Researchers/Getty Images 313 (right); Susan Perry 315; National Library of Medicine 316; © Eric Isselée - Fotolia.com 321; Richmond-HRR Pseudochromatic Plates 4th edition, Courtesy of Richmond Products 323 (left); Caldesi and Montecchi/The Bridgeman Art Library/Getty Images 323 (right); Susan Perry 324 (both), 325 (all); Stem Labs, Inc. 326 (both); George Doyle/Stockbyte/Thinkstock 327; Centers for Disease Control 328; © iStockphoto.com/Peter Garbet 329; Robert Vidéki, Doronicum Kft., Bugwood.org 330; NASA 331

Chapter 14

STEVE GSCHMEISSNER/Science Photo Library/Getty Images 335; PhotoDisc, Inc. 336, 343 (left); Model courtesy 3dCafe.com 337; © Science Faction/SuperStock 343 (right); BJU Photo Services 345, 350, 351; © iStockphoto.com/JoseGirarte 353; www.comstock.com 354; LARRY MULVEHILL/Photo Researchers/Getty Images 355; The Telegraph 357 (top); Library of Congress 357 (bottom); Susan Perry 359

Chapter 15

Blend Images/ERproductions Ltd/the Agency Collection/Getty Images 361; Edgar Fahs Smith Collection, University of Pennsylvania Libraries 362; Sue Renault/Christine Nichols, American Leprosy Missions 364 (top); © iStockphoto.com/Carrot-eater 364 (center); Centers For Disease Control 364 (bottom: anthrax, yersinia), 365; SCIENCE SOURCE/Photo Researchers/Getty Images 364 (bottom: straph); Jeff Topping/Stringer/Getty Images News/Getty Images 368; BJU Photo Services 371, 382; Getty Images/iStockphoto/Thinkstock 376 (top); © iStockphoto.com/Sean Locke 376 (bottom); Chris Ware/Stringer/Hulton Archive/Getty Images 377 (top); © Mediscan/Visuals Unlimited 377 (bottom); PhotoDisc, Inc. 378 (all); © Lisa S./Shutterstock 379; David Robbins, MD, Director of Robotic Surgery, Urological Consultants of Florida, www.miamiurologyconsultants.com 380; ©2012 Intuitive Surgical, Inc. 381 (both)

How to Use the Teacher's Toolkit

Contents

The Teacher's Toolkit contains the following materials:

- Activity Manual Answer Key
- Bulletin Board Ideas
- Diagrams
- Game Bank
- Instructional Aids
- Materials List
- National Science Education Content Standards
- Quizzes and Answer Key
- Rubrics
- Science Fair Information

Getting Started

Viewing the Teacher's Toolkit materials requires Adobe® Reader® 9.0 or higher. The most recent version of Adobe Reader may be downloaded at no charge from the Adobe website at www.adobe.com. An Internet connection is required to download Reader.

Windows

Insert the CD. The CD is designed to start automatically if your computer is set to allow it. If it does not start automatically, click "Run" if given the option. You may also choose to open the folder to view the CD's files and double-click "Startup.exe" to start the CD. Read and accept the license agreement to begin using the Teacher's Toolkit materials. Navigate within the CD using the bookmarks on the left side of the screen.

Mac

Insert the CD, click on the CD icon, and open the file "main.pdf" to begin using the Teacher's Toolkit materials.

Minimum System Requirements

Processor: Pentium IV

Operating System: Windows XP or Mac OS Leopard (version 10.5)

RAM: 256 MB

Display: 1024 × 768

Adobe Reader: version 9.0

Additional Help

Additional usage information can be found on the CD. For further assistance, call BJU Press Customer Service at 1-800-845-5731.