Columbus County Schools
Science Curriculum Guide

SUBJECT: Science	**GRADE LEVEL:** 7th	**GRADING PERIOD:** 2nd 9 weeks
Module(s): A – Cells and Heredity	Time Frame: 4 weeks	**Unit: Cells and Heredity** (Evolution and Genetics)
Essential Standard: **7.L.2: Understand the relationship of the mechanisms of cellular reproduction, patterns of inheritance and external factors to potential variation among offspring.**		

Lesson: Sexual/Asexual Reproduction (Time Frame: 2 Weeks)	**Technology and Literacy Standards and Tasks**	**Academic Vocabulary:**	**Assessment(s):**	**Additional Resources:**
Clarifying Objective: **7.L.2.1:** **Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Essential Questions:** How do cells divide? How do cells divide for sexual reproduction? How do organisms reproduce?	***Science Fusion* Online Components and Digital Lessons** **Write to Learn (See Additional Resources)** **Other Strategies:** • Graphic Organizers • Venn Diagram Comparing Sexual and Asexual Reproduction • Summarizing Video • Mitosis Project • Bell Ringers/Exit Tickets **Technology Standards** 7.RP.1: 7.SE.1: **Literacy Standards:** CCSS.ELA-Literacy.RST.6-8.7 CCSS.ELA-Literacy.RST.6-8.9	• DNA • chromosomes • cell cycle • interphase • mitosis • cytokinesis • sexual reproduction • asexual reproduction • fertilization • heredity • genotype • phenotype	**Formative:** • **Uncovering Student Ideas in Science Vol. 2 (Keeley)** ○ Baby Mice page 130 • Write to Learn Assignment • Quiz • Review Games • Group Assignments • Bell Ringers/Exit Tickets **Summative:** • **Unit Tests** • **County Benchmarks** • **Projects** • ***Exam View* Test bank** • SchoolNet Test bank	McDougal Littell 7th Grade Science Book page 70C – 159 C Science Fusion Work Book Cells and Heredity page 90 - 175 Science Fusion Teacher Edition Cells and Heredity page 132 – 235 **Write to Learn** **Science 6 2.3 How do cells grow and divide?**

Lesson: Heredity and Genetics **(Time Frame: 2 Weeks)**	**Technology and Literacy Standards and Tasks**	**Academic Vocabulary:**	**Assessment(s):**	**Additional Resources:**
Clarifying Objective: **7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **7.L.2.3: Explain the impact of the environment and lifestyle choices on biological inheritance (to include common genetic diseases) and survival.** **Essential Question:** How are traits inherited? How are patterns of inheritance studied?	***Science Fusion* Online Components and Digital Lessons** **Write to Learn (See Additional Resources)** **Other Strategies:** • Graphic Organizers • Summarizing Video • Bell Ringers/Exit Tickets **Technology Standards** 7.RP.1: 7.SE.1: **Literacy Standards:** CCSS.ELA-Literacy.RST.6-8.3 CCSS.ELA-Literacy.RST.6-8.7 CCSS.ELA-Literacy.RST.6-8.4	• dominant • genes • phenotype • recessive • allele • incomplete dominance • codominance • Punnett square • ratio • probability • pedigree • nucleotide • replication • mutation • RNA • ribosome • biotechnology • genetic engineering • artificial selection clone • genetic disease	**Formative:** • Bell Ringers/Exit Tickets • Graphic Organizers • Extended Response Questions • Write to Learn Assignments **Summative:** • Unit Tests • County Benchmarks • Projects • *Exam View* Test bank • SchoolNet Test bank	McDougal Littell 7th Grade Science Book page 70C – 159 C Science Fusion Work Book Cells and Heredity page 90 - 175 Science Fusion Teacher Edition Cells and Heredity page 132 - 235 **Write to Learn:** **Cells and Heredity: 5.1 Darwin's Theory**

Technology Standards Used in this Unit:

7.RP.1: Group work and individual research activities using online resources.

7.SE.1: Learn safe practices when using online resources and the proper way to summarize retrieved information.

Literacy Standards Used in this Unit:

CCSS.ELA-Literacy.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CCSS.ELA-Literacy.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

CCSS.ELA-Literacy.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CCSS.ELA-Literacy.RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Day 1 **Lesson: Sexual and Asexual Reproduction**	**Day 2** **Lesson: Sexual and Asexual Reproduction**	**Day 3** **Lesson: Sexual and Asexual Reproduction**	**Day 4** **Lesson: Sexual and Asexual Reproduction**	**Day 5** **Lesson: Sexual and Asexual Reproduction**
Clarifying Objective: 7.L.2.1: Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis). **Academic Vocabulary:** DNA, chromosomes, cell cycle, interphase, mitosis, cytokinesis, sexual reproduction	**Clarifying Objective: 7.L.2.1: Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** DNA, chromosomes, cell cycle, interphase, mitosis, cytokinesis, sexual reproduction	**Clarifying Objective: 7.L.2.1: Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** DNA, chromosomes, cell cycle, interphase, mitosis, cytokinesis, sexual reproduction	**Clarifying Objective: 7.L.2.1: Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** DNA, chromosomes, cell cycle, interphase, mitosis, cytokinesis, sexual reproduction	**Clarifying Objective: 7.L.2.1: Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** DNA, chromosomes, cell cycle, interphase, mitosis, cytokinesis, sexual reproduction
Bell Ringer: Engage and Explore Activity ***How do they get so big?*** **(pg. 130 TE–Module A) Science Fusion Module A: Cells and Heredity** **Instructional Tasks: Read Unit 2- Lesson 1 Mitosis: pg. 92-97 Student Workbook**	**Bell Ringer: Interpreting Visuals** **Examine the diagram of the cell cycle. Identify the main stages and tell which stage is the longest. Pg.138 TE-Module A** **Instructional Tasks: Re-read about the phases of mitosis.** **Have students make a chart**	**Bell Ringer:** **Mitosis Diagram Label** **See worksheet file: (word document) Mitosis diagram** **Instructional Tasks: Mitosis Worksheet Extra Practice:** Application of stages of Mitosis **See worksheet file: (word**	**Bell Ringer: Two Multiple Choice Questions on Mitosis and/or Cell Cycle** **Instructional Tasks: Quick Lab: DNA, Chromosomes, and Cell division** **OR** **Quick Lab: Mitosis Flipbooks**	**Bell Ringer: Choose 2 of the vocabulary words from this week and make a word triangle for both!** **Instructional Tasks: Alternative Assessment** Climb the Ladder Mitosis (pg. 135 TE) **OR** **Quiz on Mitosis and Cell**

Or **Digital Lesson on Mitosis** **Summarizer:** **What is mitosis?**	**(see text pg. 97 in student workbook) that includes defining the stages of mitosis by writing the details and drawing the cell detail.** **Summarizer:** What would happen in a cell went through mitosis but did not go through cytokinesis?	**document) Mitosis worksheet** OR **Use Differentiated Instruction pg. 133 TE** Order Matters Phases of Mitosis Comic **Summarizer:** **Probing Questions (TE pg. 139)** Sometimes a cell inaccurately duplicates its DNA, and the resulting cells are not identical. Ask: What effects might such results have?	(See pg. 131 TE) **Summarizer:** **Critical Thinking from Lesson Review segment** Student Workbook pg. 99 #8-10 (Pg. 140 TE)	**Cycle** **Summarizer:** **Previewing Vocabulary- Root Words and Origins:** (Pg. 133 TE)
Assessment: observation and participation	**Assessment:** Graded Assignment, participation and observation	**Assessment:** Graded Assignment, participation and observation	**Assessment:** observation and participation	**Assessment:** Summative Assessment

Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
Lesson: Reproduction and Heredity	**Lesson: Reproduction and Heredity**	**Lesson: Reproduction and Heredity**	**Lesson: Reproduction and Heredity**	**Lesson: Reproduction and Heredity**
Clarifying Objective: 7.L.2.1: **Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** **homologous chromosomes, meiosis, gametes**	**Clarifying Objective: 7.L.2.1:** **Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** **homologous chromosomes, meiosis, gametes**	**Clarifying Objective: 7.L.2.1:** **Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** **homologous chromosomes, meiosis, gametes**	**Clarifying Objective: 7.L.2.1:** **Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** **asexual reproduction, sexual reproduction, fertilization, budding, binary fission, spores**	**Clarifying Objective: 7.L.2.1:** **Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** **asexual reproduction, sexual reproduction, fertilization, budding, binary fission, spores**
Bell Ringer: **Engage Your Brain pg.150 TE #1 & 2** **(pg. 101 Student Workbook)** **Instructional Tasks:** **Read Unit 2- Lesson 2 pg. 102-106** **Use Skeletal Notes with Lesson 2**	**Bell Ringer:** **Interpreting Visuals: pg. 151 TE** **Questions on male chromosome visual** **Instructional Tasks:** **Compare Meiosis and Mitosis Chart (Student Workbook pg. 106)** **OR**	**Bell Ringer: Critical thinking from Lesson Review #7-9 (pg. 109 Student Workbook)** **Instructional Tasks:** **Complete Visual Summary questions (Student Workbook pg. 108)** **Answer Meiosis Worksheet (see word file: Meiosis**	**Bell Ringer: Read Health Watch: Down Syndrome (pg. 107 Student Workbook) Answer questions # 13-14** **Instructional Tasks:** **Quiz on Meiosis** **AND** **Begin reading Lesson 3: Sexual and asexual**	**Bell Ringer: Engage Your Brain #1-2 (TE pg. 166)** **Instructional Tasks:** **Advantages of Asexual and Sexual Reproduction VENN DIAGRAM (see pg. 169 TE)**

OR **Meiosis Webquest** **(see word file: Meiosis Internet Lesson)** **Summarizer:** **How does the number of chromosomes in sex cells compare with the number of chromosomes in body cells?**	**Phases of Meiosis Worksheet** **(see word file: Phases of Meiosis)** **Summarizer: What is the function of meiosis?**	**Worksheet)** **OR** **Meiosis Posters-** Students will make 3D posters of Meiosis that depict each step and show what is occurring in the cell. TE Pg. 144 **Summarizer:** **Study Guide for Test on Mitosis and Meiosis**	**reproduction (TE pg.166-169)** **Summarizer:** **What are the four main ways that organisms reproduce asexually?**	**AND** **Answer Lesson Review # 1-10 pg. 121 in Student Workbook** **(TE pg. 170)** **Summarizer:** **Visual Summary Student Workbook** **pg. 120 #17-23** **TE pg. 170**
Assessment: observation and participation	**Assessment:** observation, participation, graded assignment	**Assessment:** observation, participation, graded assignment	**Assessment:** observation, participation, graded assignment	**Assessment:** observation and participation

Day 11 **Lesson: Heredity and Genetics**	**Day 12** **Lesson: Reproduction and Heredity** **Mitosis and Meiosis Assessment**	**Day 13** **Lesson: Heredity and Genetics**	**Day 14** **Lesson: Heredity and Genetics**	**Day 15** **Lesson: Heredity and Genetics**
Clarifying Objective: 7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis. **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease	**Clarifying Objective: 7.L.2.1: Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).** **Academic Vocabulary:** DNA, chromosomes, cell cycle, interphase, mitosis, cytokinesis, sexual reproduction, homologous chromosomes, meiosis, gametes	**Clarifying Objective: 7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease	**Clarifying Objective: 7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease	**Clarifying Objective: 7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease
Bell Ringer: Classifying Traits pg.180 TE **Students will list traits that they think are acquired or inherited. Students will**	**Bell Ringer: N/A** **Instructional Tasks: Assessment on Mitosis and Meiosis**	**Bell Ringer: Engage Your Brain pg. 180 TE**	**Bell Ringer: Interpreting Visuals pg. 181 TE** **(4 questions on pea pod color)**	**Bell Ringer: Engage your brain #1 & 2 (pg. 196 TE)** **Instructional Tasks: Read Unit 2- Lesson 5 Student Workbook pg. 138-**

add to or change the list as they read Lesson 4. **Instructional Tasks:** **Read Unit 2- Lesson 4 Student Workbook pg. 124-127** **Vocabulary Activity: Define the 8 terms found in Student Workbook pg. 123. Use any vocabulary strategy you like: word triangle, four square, or flip book** **Summarizer: Draw a picture of a chromosome and label its parts; alleles and gene!** **(see pg. 182 TE)**	**Summarizer: N/A Test Day**	**Instructional Tasks: Finish reading Unit 2- Lesson 4** **Student Workbook pg. 128-131** **AND** **Answer Lesson Review #1-9 pg. 133 Student Workbook** **Summarizer: Interpreting Visuals: Photos of the Arctic Cat pg. 183 TE**	**Instructional Tasks:** **Digital Lesson on Heredity** **OR** **Virtual Lab "Crossing Pea Plants"** **Summarizer: What is the difference between co-dominance and incomplete dominance?**	**142** **OR** **Digital Lesson on Punnett Squares** **Lesson 5- Slides 1-10** **Summarizer: Why is it important to understand genetics and heredity? (pg. 185 TE)**
Assessment: observation and participation	**Assessment:** Summative Assessment	**Assessment:** observation, participation, graded assignment	**Assessment:** observation, participation, graded assignment	**Assessment:** observation, participation, graded assignment

Day 16 **Lesson: Heredity and Genetics**	**Day 17** **Lesson: Reproduction and Heredity**	**Day 18** **Lesson: Heredity and Genetics**	**Day 19** **Lesson: Heredity and Genetics**	**Day 20** **Lesson: Heredity and Genetics**
Clarifying Objective: **7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease	**Clarifying Objective:** **7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease	**Clarifying Objective:** **7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease	**Clarifying Objective:** **7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease	**Clarifying Objective:** **7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.** **Academic Vocabulary:** dominant, genes, phenotype, recessive, allele, incomplete dominance, codominance, Punnett square, ratio, probability, pedigree, nucleotide, replication, mutation, RNA, ribosome, biotechnology, genetic engineering, artificial selection clone, genetic disease
Bell Ringer: Active Reading, #3 & #5 **Instructional Tasks:** **-Complete Visual of Punnett Square- #6 &7 (pg. 139 Student workbook)**	**Bell Ringer: What is the phenotype of an individual with one allele for dimples and one allele for no dimples?** **Instructional Tasks:** **Bikini Bottom Genetics Incomplete Dominance**	**Bell Ringer: Interpreting Visuals TE p. 182** **Instructional Tasks:** **Bikini Bottom Genetics Review** **Summarizer:** **Visualize It! p. 139 Student**	**Bell Ringer: Heredity Game TE p. 178 or Modify it to a set of questions on the board or paper** **Instructional Tasks:** **Bikini Bottom Genetics Quiz**	**Bell Ringer:** **Lesson Review Critical Thinking Question #11 Pg. 185 TE** **Instructional Tasks:** **Climb the ladder; It's Hereditary**

-Do the Math Activity- **(pg. 140-141 Student workbook)** **OR** **Practice worksheet on Punnett Squares** Bikini Bottom Genetics Punnett Square Practice Bikini Bottom Genetics #2 **Summarizer:** Discuss and answer questions students may have about Punnett squares	**Summarizer:** **Visualize It #16 p. 130 Student Workbook**	**Workbook**	**Genetics Review Challenge** **Summarizer:** **Math Connection TE p. 194**	**Alternative Assessment pg. 179 TE** **Formative Assessment:** **Uncovering Student Ideas in Science Vol. 2 (Keeley)** Baby Mice page 130 **Summarizer: Answer Visual Summary from pg. 132 Student Workbook** **(pg. 185 TE)**
Assessment: Observation and Participation	**Assessment:** Observation, participation	**Assessment:** Observation, Participation	**Assessment:** Quiz, Graded Assignment	**Assessment:** Summative Assessment