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Curricular Standards

The module is appropriate for an engineering course grades 9-12, and incorporates the following topics:

- Introduction to mycelium and its possibilities
- Introduction to the engineering design process
- Practice in metric measurements
- Technical sketches including isometric and multiview
- CAD skills using Fusion 360

NGSS & Common Core Standards	
Lesson 1: Mycelium and its possibilities	Lesson 2: Mycelium design challenge
CCSS.WHST.9-10.9 - Draw evidence from informational texts to support analysis, reflection and research. NGSS.SEP.8 - Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes or information presented in a text by paraphrasing them in simpler but still accurate terms. NGSS.CCC.CETAS - New technologies can have deep impacts on society and the environment, including some that were not anticipated.	NGSS.CCC.CETAS - Science and engineering complement each other in the cycle known as research and development (R&D). ISTE.1.4.a. know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. ISTE.1.4.b. select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. ITEEA.STEL-7Y. Optimize a design by addressing desired qualities within criteria and constraints.
Lesson 3: Measurements	Lesson 4: Working in 3D planes
CCSS.Math.6.RP.A.3d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. CCSS.Math.6.SP.B.5b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. CCSS.Math.MP.2. Reason abstractly and quantitatively CCSS.Math.5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	CCSS.Math.HSG-CO.A.5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. CCSS.Math.HSG-CO.D.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line. CCSS.Math.HSG-GMD.B.4. Identify cross-sectional shapes of slices of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
Lesson 5: Communicating a design	Lesson 6: Fusion 360 skills
ISTE.1.4.c. develop, test and refine prototypes as part of a cyclical design process.	NGSS.CCC.6 - Investigating or designing new systems or structures requires a detailed examination of the

ISTE.1.4.d. exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.	properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem. ISTE.1.4.b. select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. ISTE.1.4.d. exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
Lesson 7: Understanding constraints	Lesson 8: Planning your design
ITEEA.STEL-7W. Determine the best approach by evaluating the purpose of the design ITEEA.STEL-7Y. Optimize a design by addressing desired qualities within criteria and constraints.	NGSS-HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. NGSS.CCC.CNS - Science and engineering are influenced by society and society is influenced by science and engineering. NGSS.SEP.6 - Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and trade off considerations. ITEEA.STEL-7W. Determine the best approach by evaluating the purpose of the design. ITEEA.STEL-7BB. Implement the best possible solution to a design. ITEEA.TEP-2.Elaborates and articulates novel ideas and aesthetics.
Lesson 9: Build your prototype	Lesson 10: Evaluate and improve
ITEEA.TEP-5.Shows persistence in addressing technological problems and finding solutions to those problem. ITEEA.STEL-5H. Evaluate a technological innovation that arose from a specific society's unique need or want.	NGSS-MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services. NGSS.SEP.3 - Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts. CCSS.WHST.9-10.2d - Use precise language and domain specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. NGSS.SEP.6 - Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and trade off considerations.