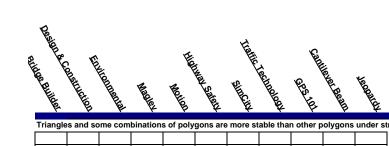


# Grade 6

#### MATH - Grade 6: Numerical and Proportional Reasoning Whole numbers, fractions, decimals and integers can be modeled on number lines, scales, and the coordinate plane and used to solve problems. Locate, order and compare whole numbers and integers on number lines, scales and the coordinate grid. Use absolute value to represent distance between two points on a number line. Choose appropriate linear, area and set models and pictures of fractions, decimals, mixed numbers, and improper fractions to locate, label, order, compare, round, and estimate values on number lines, coordinate grids, scales and measuring tools. Explore magnitude of decimal values by comparing 0.1 and 0.01 more and less than a given number. V V V V v V v Use estimation to predict reasonable answers and recognize and explain when an estimate will be more or less than an exact answer. Appropriate computational strategies facilitate problem solving. Estimate and use a variety of computational strategies (mental computation, paper-and-pencil, and calculator) to add, subtract, multiply and divide multi-digit numbers in the V V V context of multi-step word and practical problems. Use factors of composite numbers, multiples of 10, 100 and 1000 and divisibility rules to estimate products and missing factors. Choose, construct and use a variety of models and pictures to estimate and demonstrate addition and subtraction of fractions, decimals and mixed numbers, and relate the models to the use of equivalent forms and common denominators. Estimate and use calculators to add, subtract and multiply fractions and decimals. Create and solve a variety of problems involving fractions, decimals, mixed numbers, money and simple percents. J Place value patterns may be expressed using exponents to write powers of ten. Explore place value patterns when multiplying and dividing decimals by 10, 100, 1000 and multiples of 10. Use models, number patterns and common factors to rewrite a rational number in its equivalent fraction, decimal, ratio and percent forms and as powers of ten. Compare large numbers using expanded forms and powers of ten. Develop, describe and use a variety of ways to estimate and calculate with large numbers and connect the strategies to powers of ten. The division interpretation of fractions may be used to write equivalent decimal forms. V Use models and common factors to identify equivalent fractions and decimals. V √ √ Use models to explore the definition of division with decimals, fractions and mixed numbers. Write and round division problems in fraction form to estimate an answer to a division problem. With fractions and decimals, products or quotients may be larger or smaller than either factor. Construct and use models and the distributive property to estimate reasonable answers and multiply fractions, decimals, mixed numbers and percents. Recognize that multiplication by a unit fraction is equivalent to dividing by the fraction's denominator. Interpret finding a fractional part of a set as a two-step division and multiplication problem Percent is an expression of frequency in terms of parts per hundred Use models, number patterns and the distributive property to estimate and find the percent of an amount. V √ ۰. ۰. Use benchmarks and number patterns to estimate and find percents. Ratios and rates may be used to compare guantities Use ratios and proportions to calculate simple rate conversions. ۰ √ √ √ √ 1 1 Build models of equivalent ratios and use proportions to solve problems. (For ex., scale drawings, similar polygons, equivalent mixtures, probability and unit rates.) MATH - Grade 6: Algebaic Reasoning Relationships that are expressed in words may be translated into algebraic expressions, equations or inequalities. Represent numerical situations with algebraic expressions, equations and inequalities. Explore using variables as placeholders, to denote a pattern, to write a formula and to represent a function or relation. Explore how codes are used to communicate information. Mathematical relationships may be represented and analyzed with the help of tables, graphs, equations and inequalities. Use substitution to evaluate algebraic expressions and formulas V √ Describe, extend and analyze numeric, geometric and statistical patterns and use them to identify trends and justify predictions. Identify linear functions from tables, graphs or equations and use graphs to analyze the nature of changes in linear relationships. Simple one-step equations can be solved using informal methods Solve simple linear equations using materials that model equivalence such as a balance or guess-and-check. Solve simple linear equations using order of operations and algebraic properties. When there is a relationship between two variables, the rate of change may be constant or varying. Create and use tables, graphs, words, equations and inequalities to represent, analyze and describe relationships, with constant and varying rates of change. ۰. The metric system of measurement is based on powers of ten and ratios where multiples of ten underlie unit conversions. Explore the different ratios used to convert between units of length, area and volume in the customary system. Recognize and use powers of ten as conversion ratios in the metric svstem.

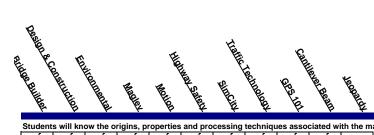


## Grade 6

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Triang	les and se	ome com	bination	is of poly	gons ar	e more s	table tha	in other p	polygons	under s	
											Explore similarity of polygons and the effect of dilations (a reduction or enlargement) on changes of perimeter and area.
											Use the relationships of sides and angles to classify sets and subsets of polygons.
Angle I	Angle measurement is based on rotation.										
											Estimate and measure angles based on rotation about a point. Locate points on a circular coordinate system. Build and use angle measurement tools such as: circular protractor, angle ruler, and goniometer.
	<i>,</i>			<u> </u>	L	<u> </u>	L	L	L .		
The for	rmulas to	r the area	a of trian	igles, pai	rallelogra	ams, trap	bezolds a	and circle	es are ba	sed on ti	ne rectangle.
											Use the rectangle as a basic shape to model and develop formulas for the area of triangles, parallelograms, trapezoids and circles.
											Explore symmetry on rectangular and circular coordinate grids.
											Explore the relationship of radius, diameter, circumference and area of the circle. Approximate the value of pi.
Proble	ms involv	ring mea	suremen	nt can be	solved t	hrough t	he use o	of approp	oriate too	ls, techn	iques and strategies.
											Choose among nonstandard and standard referents to estimate length, area, volume, mass and angle measures.
<b>v</b>	1	V	√	1	√						Select and use appropriate units, strategies and tools to estimate, measure and solve problems involving length, perimeter, area, volume, capacity, weight, mass, temperature and
•		•	•	•	•						angles.
MATH	MATH - Grade 6: Working with Data: Probability and Statistics										
Sets of	f data can	be displ	ayed an	d compa	red usin	g variou	s system	atic or g	raphical	represen	tations.
√	√	√									Select and use appropriate graphical representations including histograms, double bar graphs, back-to-back stem-and leaf plots and scatter plots.
√	√	√									Make conjectures, design simulations and samplings. Organize, display, and analyze the data appropriately.
√	√	√	√	√	√						Recognize and describe patterns and trends in data from tables and graphs. Make and defend predictions based on those patterns and trends.
√	√	√	√	√	√						Construct circle graphs and recognize that they represent data proportionally.
√	√	√	√	√	√						Solve problems involving the organization of data, including sorting by multiple attributes.
√	√	V	√	√	√						Use systematic listing and counting strategies, including simple combinations and permutations, to solve problems.
Measu	res of spr	ead and	measure	es of cen	tral tend	ency car	h be used	d to desc	ribe the	shape of	data sets.
	1									· ·	Describe the shape of data sets using measures of spread (range and outliers) and central tendency (mode, median and mean).
V	1	1	√	1	√						Recognize that changes in a data set can affect the mode, median, mean and range.
	oilities are	useful f		cting what		ppen in	a large n	umber o	f trials, b	ut will no	t determine, for certain, the outcome of a single trial.
							J	1			Identify the effect the number of trials has on predicting outcomes over the long run.
1	-	V									Design and conduct probability experiments and make predictions about outcomes that are equally likely or not equally likely.
-	oility can	-	ssed in v	various fe	orms.						
	1	1		1					1		Express probabilities as fractions, ratios, decimals and percents.
SCIE	NCE - G	rade 6	Core	Scienti	fic Ing	uiry Li	teracy	and Nu	Imerac		
											d physical properties.
Wateria		Classifie	eu as pu		ances or	mixture	s, depen				
											Describe the properties of common elements such as oxygen, hydrogen, carbon, iron and aluminum.
											Describe how the properties of simple compounds, such as water and table salt, are different from the properties of the elements of which they are made.
An	aveter i			l the nen	ulationa	that are	living in	a cortain		nd the n	Explain how mixtures can be separated by using the properties of the substances from which they are made, such as particle size, density, solubility and boiling pt. hysical factors with which they interact.
Alleco	system	s compo:		i tile pop	Julations	tilat ale	living in	a certan	ii space a	inu ine p	
						<u> </u>	<u> </u>	<u> </u>	+		Describe how abiotic factors such as temperature, water and sunlight affect plants' ability to create their own food through photosynthesis.
	+	ł			<b> </b>	ł	ł	ł	+		Explain how populations are affected by predator-prey relationships.
Variati			l			 			l della	 	Describe common food webs in different Connecticut ecosystems.
variatio	on in the	amount o		in s energ	gy nitting	y the ⊨ar	tn's surf	ace affec	cts daily	and seas	onal weather patterns.
		<b>_</b> √	<b>√</b>	<u> </u>		<b> </b> ,	<u> </u>	<b> </b> ,	-		Describe the effect of heating on the movement of molecules in solids, liquids and gases.
		_ √	_√_			_ √_		_ √			Explain how local weather conditions are related to the temperature, pressure and water content of the atmosphere and the proximity to a large body of water.
		√	_ √	<u> </u>		√	<u> </u>	√			Explain how the uneven heating of the Earth's surface causes winds and affects the seasons.
Water	moving a		d throug	h earth n	naterials	carries	with it th	e produc	cts of hu	nan activ	
_ √_	_ √	_ √									Explain the role of septic and sewage systems on the quality of surface and ground water sources.
_ √	√	√									Explain how human activity may impact water resources in Connecticut such as local ponds, rivers and the Long Island Sound ecosystem.
TECH	I ED - G	rades !	5-8 - Eo	conomi	cs						
Studen	nts will un	derstand	the link	betweer	n techno	logy and	I the eco	nomy, ar	nd recog	nize that	link as the force behind societal emergence and evolution.
			√								Describe how societies are organized to produce and distribute goods and services in a structured manner.
_√	√	√	√	√	√	√	√	√	√		Describe how society uses resources and distributes its goods and services.
	√	√			√	√	√				Describe how a business produces profit.
		√			√	√	√				Describe the major economic and political systems in relation to technological activity.
-											

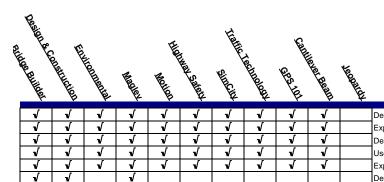
### Grade 6

Design & Con-	Entitic	routmental	Magler	Highter	mat satety	Trattict	- Lechnology	Canture Greature	tileuer Bream	teopartit	Below are the Connecticut Standards of Learning in Math, Technology, Social Studies, and Science and arranged by competency area and Grade. The Standards are checked (1) to identify the extent to which TRAC PAC 2 modules relate to the Connecticut Standards.
		V			V	V	√				Identify three types of businesses.
√	V	√			√	√	√				Describe free enterprise.
		√_			√_	_√	√		<u> </u>		Analyze a product for its ability to satisfy consumer demands.
		_√			√ ∕	<u></u>	_ √_	ļ'	ļ!		Develop skills in making wise consumer decisions.
TECH	ED Cr	√ odeo 5	о То	hnolo	√ viool In	√ Noot	√				Discuss the global market/ economy and understand its effects on the United States.
TECH E					-	-	on the ce	oiol oult	ural and	onviron	nmental aspects of their lives.
Students	swiii unu √		√ The impa	√ V	Jorounoa 1	Jy nas o √				enviror √	Explain how technology has expected and unexpected effects.
√	٠ ا	√	√	٠ ا	√		√	√	√	√	Explore personal, societal, economic and environmental effects of technological systems.
V	V	V	√	√	V	√	√	√	√	v	Trace the historical development of at least one technology, identifying its effects and hypothesizing about its future.
√	√		√			√	√	√	√	√	Identify the social and economic impacts of automation and computer-controlled processing.
											Describe the universal input, process, output, feedback (IPOF) systems model.
√.	V	_√	√ ,	√	V		√	√	√_	√_	Develop criteria for evaluating technology.
√	V	√	√	V	√	_√	<u> </u>	<u>_</u>	√_	√	Identify and describe how individual technological innovations may be combined to create new technologies.
<b>TECH</b>											
Students	s will bec	ome awa	re of the	world o	f work a	nd its fu	inction in	1 society	, diversit	ty, expe	ctations, trends and requirements.
v √	v √	v √	v √	v √	v √	 √	v √	v √	v √	 _√	Describe how technological development affects careers and occupations. Demonstrate awareness of changes in job requirements over time.
	v √	V V	v √	v √	v √		 √	v √	v √	v √	Demonstrate awareness of changes in job requirements over time. Describe strategies for assuming responsibility.
J J	v √	7	V	v √	v √	v √	₩ V	v √	v √	v √	Develop personal responsibility and accountability in the workplace.
-	- V	J.	v √	V	V V	- -	J.	v √	v √	v √	Define and discuss personal and professional ethics.
V	V	<b>v</b>	√	V	V		V	√	√.	٠ ا	Discuss coping strategies for change.
V	√	√	√	√	√	~	√	√	√	√	Identify expectations in the workplace.
√	V	√	V	√	√	√	√	√	√	√	Define and discuss the concept of "work ethic."
√	√	V	V	V	√	√	√	√	√	√	Explore career options.
	√	√	√	√	V	√	√	√	_ √	√	Define and discuss "career path."
							earch &				
Students	s will reco	ognize teo	chnolog	y as the	result of √	a creati	ive act, a	ind will b	e able to	apply ∂	disciplined problem-solving strategies to enhance invention and innovation.
v √	v √	▼ -/	v	v	v	v	v	V	V	v √	Differentiate between human problems and needs.
			_/	-1	-/		-/		_/		
	- <b>-</b>	V V	√ √	√ √	√ √	< <	√ √	√ √	√ √	-	Define decision-making, research and invention.
v √	√ √	v √ √	V	V	V	V	√.	√ √ √	√	√	Discuss how technological systems have been used to solve human problems.
v √ √	√ √ √	▼ √ √	-			< <	-	V	_	-	
	V		√ √	√ √	√ √	V	√ √	√ √	√ √	√ √	Discuss how technological systems have been used to solve human problems. Select and apply a general problem-solving model in a laboratory setting.
						V			✓ ✓ ✓ ✓	$\sqrt{\sqrt{1}}$	Discuss how technological systems have been used to solve human problems. Select and apply a general problem-solving model in a laboratory setting. Identify research methods, materials and techniques.
						V			√ √ √ √ √		Discuss how technological systems have been used to solve human problems. Select and apply a general problem-solving model in a laboratory setting. Identify research methods, materials and techniques. Apply cooperative techniques while engaged in group problem-solving activities. Engage in an activity that requires creativity. Describe and apply the processes used to make decisions.
						V			✓ ✓ ✓ ✓		Discuss how technological systems have been used to solve human problems. Select and apply a general problem-solving model in a laboratory setting. Identify research methods, materials and techniques. Apply cooperative techniques while engaged in group problem-solving activities. Engage in an activity that requires creativity. Describe and apply the processes used to make decisions. Apply appropriate and effective questioning techniques.
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						V			<		Discuss how technological systems have been used to solve human problems. Select and apply a general problem-solving model in a laboratory setting. Identify research methods, materials and techniques. Apply cooperative techniques while engaged in group problem-solving activities. Engage in an activity that requires creativity. Describe and apply the processes used to make decisions. Apply appropriate and effective questioning techniques. Conduct an applied research project. Develop, test and modify a design idea through experimentation.
						V		<<<<<<<<>><<<<<<<<<<<<<<<<<<<<>><<<<<<<	<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<		Discuss how technological systems have been used to solve human problems. Select and apply a general problem-solving model in a laboratory setting. Identify research methods, materials and techniques. Apply cooperative techniques while engaged in group problem-solving activities. Engage in an activity that requires creativity. Describe and apply the processes used to make decisions. Apply appropriate and effective questioning techniques. Conduct an applied research project. Develop, test and modify a design idea through experimentation. Differentiate between invention and innovation.
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√ √ √ √ √ √ √ TECH 1 Students	         ED - Gr S will ider  	ntify and o		v v v v v v v v v v v v v v	$ \frac{}{} $		$     \begin{array}{c}          \\     $				Discuss how technological systems have been used to solve human problems.         Select and apply a general problem-solving model in a laboratory setting.         Identify research methods, materials and techniques.         Apply cooperative techniques while engaged in group problem-solving activities.         Engage in an activity that requires creativity.         Describe and apply the processes used to make decisions.         Apply appropriate and effective questioning techniques.         Conduct an applied research project.         Develop, test and modify a design idea through experimentation.         Differentiate between invention and innovation.         Develop a solution for a real-life problem.         Create a simple flowchart of their daily activities.         Engage in presentation activities.         Identify the elements of interpersonal communication.         Identify and demonstrate organizational skills.         Explore different roles while working cooperatively and effectively in team situations.
√ √ √ √ √ √ √ TECH 1 Students	$\sqrt[4]{1}$ $\sqrt[4]{1}$	ntify and o	√ √ √ √ √ √ √ √ √ √ √ √ √ √ √	v v v v v v v v v v v v v v	$ \sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt$						Discuss how technological systems have been used to solve human problems.         Select and apply a general problem-solving model in a laboratory setting.         Identify research methods, materials and techniques.         Apply cooperative techniques while engaged in group problem-solving activities.         Engage in an activity that requires creativity.         Describe and apply the processes used to make decisions.         Apply appropriate and effective questioning techniques.         Conduct an applied research project.         Develop, test and modify a design idea through experimentation.         Differentiate between invention and innovation.         Develop a solution for a real-life problem.         Create a simple flowchart of their daily activities.         Engage in presentation activities.         Ingage in presentation activities.         Identify the elements of interpersonal communication.         Identify the and demonstrate organizational skills.         Explore different roles while working cooperatively and effectively in team situations.         Demonstrate strategies for effectively managing time.
$ \frac{1}{\sqrt{1}} \frac{1}{1$	         ED - Gr S will ider  	ntify and o			$ \frac{}{} $	$\begin{array}{c c} \hline & & \\ \hline \\ \hline$	$     \begin{array}{c}          \\     $				Discuss how technological systems have been used to solve human problems.         Select and apply a general problem-solving model in a laboratory setting.         Identify research methods, materials and techniques.         Apply cooperative techniques while engaged in group problem-solving activities.         Engage in an activity that requires creativity.         Describe and apply the processes used to make decisions.         Apply appropriate and effective questioning techniques.         Conduct an applied research project.         Develop, test and modify a design idea through experimentation.         Differentiate between invention and innovation.         Develop a solution for a real-life problem.         Create a simple flowchart of their daily activities.         Engage in presentation activities.         Identify the elements of interpersonal communication.         Identify and demonstrate organizational skills.         Explore different roles while working cooperatively and effectively in team situations.



## Grade 6

			•		•			•		•	
Student	s will kno	ow the o	rigins, p	roperties	and pro	cessing	techniqu	ues asso	ciated wi	th the m	aterial building blocks of technology.
_ √	√	√	_√	√	√	√	√	√	√		Identify and describe a group of new and recycled materials used in technological systems.
_√	√	√	√								Differentiate between primary and secondary raw materials.
											Explore methods used to convert raw and recycled materials into usable products.
											Demonstrate the appropriate selection and safe operation of basic hand and power tools.
√	√	√	_√	√				√			Use manual and electronic measuring devices accurately.
											Explore the principles of manual material-processing techniques.
											Describe how products are manufactured.
											Demonstrate a working knowledge of the layout, shaping, smoothing, assembly and finishing techniques used to produce a product.
											Explore the principles of computer-controlled processing techniques.
											Produce simple products from a variety of materials, using manual and computer controlled devices.
TECH	ED - G	rades 5	5-8 - Co	ommun	icatior	Syste	ms				
Student	s will une	derstand	and be	able to e	ffectivel	y apply p	hysical,	graphic	and elec	tronic co	ommunications techniques in processing, transmitting, receiving and organizing information.
√	√	√	_√	√	√	√	√				Identify and give examples of integrated technologies.
											Identify the elements of interpersonal communication.
											Identify the elements of mass communications.
√	√	√	√	√	√	√	√	√	√		Acquire technology based information and apply it in classroom and laboratory situations.
√	√	V	√	√	√	√	√	√	V	V	Explore and explain the integration of communication technologies into transportation and production systems.
√	√										Apply techniques of interpersonal and mass communication through activities such as sketching, CAD, photography, and video.
√	√	V	<b>√</b>	√	√	√	√	√	V		Evaluate and select appropriate methods of communication for a given problem or situation.
TECH	ED - G	rades 5	5-8 Pro	ductio	n Syste	ems					
Student	s will une	derstand	and be	able to d	emonsti	ate the r	nethods	involved	in turnir	ng raw m	aterials into usable products.
_√	√	_√	_√								Define manufacturing terminology, including interchange ability, automation, standardization, etc.
											Describe how products are manufactured using the methods of single craftsman, line and mass, and automated-robotics manufacturing.
√	√	√	√	√							Identify and describe the tools and methods used in manufacturing products.
											Identify the characteristics of sub- and superstructures.
√	√										Identify and describe the tools, materials, and methods used in constructing sub- and superstructures.
√	√	√	√								Design, construct and test models of shelters and other structures.
											Produce a product using a simple production sequence: layout, shaping, smoothing, assembly, and finishing techniques.
TECH	ED - G	rades (	5-8 - Tr	anspor	tation	Systen	ns				
Student	s will une	derstand	transpo	rtation s	ystems	and the e	environm	nents use	d to mov	/e goods	s and people, and the subsystems common to each.
√	√	√	√	√	√	√	<b>√</b>	√	√	√	Differentiate between vehicular and stationary transportation systems.
√	√	√	√	√	√	√	√	√	_√	_√	Differentiate between fixed and random-route land transportation systems.
√	√	_√	_√	√	√	√	√	√	_√	_√	Describe and be able to identify the trans. subsystems of body/frame, propulsion, suspension, control, guidance and support in a variety of transportation devices.
√	√	√	√	√	√	√	√	√	√	√	Explore the characteristics of lighter than air and heavier than air atmospheric transportation systems.
√	√	_√	√	√	√	√	√	√	_√	_√	Apply the concept of transportation subsystems while solving transportation problems.
_√	√	_√	_√	√ _	√	_√_	_ √	√	_√	_√	Identify and experiment with devices used to protect product and personnel in transportation systems.
√	√	<b>√</b>	√	√	√	√	√	√	√	√	Explore, build and experiment with model marine, space, land and airportation systems.
	ED - G										
Student	s will der	nonstrat	e the tea	chniques	of enter	prise an	d how th	ey relate	to produ	ict and s	service production, economics, human and material resources, and technology.
L							L			_√	Describe the evolution of techological enterprise.
L	<u> </u>			<u> </u>		<u> </u>	<u> </u>	<u> </u>		_√_	Discuss the influence of enterprise on culture, society, and the environment.
_ √	√	_√_	_√	√	√	√	_ √	√	_√_	_√	Define the terms single ownership, company, corporation, and partnership.
_ √	√	_√_	_√_	_ √	_ √	_ √	_ √	√	_√_	√	Explore the career possibilities and responsibilities in enterprise.
<b>√</b>	√.	_√	_√_	_√	√_	_√	_√_	√	_ <u>√</u>	_√_	Identify and explore a variety of organizational structures, describing the advantages and disadvantages of each
_ √	√	√	√	√	√	√	_√	√	_√	V	Explore market research and its relationship to satisfying consumer needs.
											Develop, distribute and evaluate a customer survey.
TECH ED - Grades 5-8 - Engineering Design											
-	s will be	able to a		_				-	-	tcomes	across all technology content areas.
_√_	√ V	_√_	_√	√_	√ √	_√	_ √	_√_	√		Identify the elements of design.
	√	_√_	_√_	√_	√	<u>√</u>	_√_	√	_√_		Discuss the differences between problem soving and engineering design strategies.
_ √	- √	- √	√	√	_ √	_ √	_ √	√	_ √		Explain the role of creativity in the engineering design process.



### Grade 6

Describe conceptual design, embodiment design, and detail design and identify their roles in the engineering process. Explore a variety of creativity-enhancing techniques. Develop conceptual designes for transportation, communications, production and bio-related problems. Use a variety of creativity-enhancing techniques in conceptual design situations. Explore techniques used to refine conceptual design sketches. Develop preliminary product layouts.