INVENTIONS (INVT)
CTY COURSE SYLLABUS

		WHAT **(skill goals, knowledge goals, concepts, & readings)**	**HOW** **(activities)**
Day 1	Morning	• Establish expectations • Establish class procedures • Develop interest • Establish field trip procedures • Assess prior knowledge • Differentiate between a discovery and an invention	• Introductions • Icebreakers, name and purpose • Review and sign CTY Honor Code and Lab Safety Contract • Review Class Expectations • Create Inventor self-portraits • Complete pre-assessment • Complete Discovery vs. Invention chart
	Afternoon	• Introduce the process of inventing • Reinforce planning and documentation • Develop team principles • Develop collaboration skills	• Build card towers individually • Work with groups to plan and build card towers • Record activity
	Homework	• Complete Invention Idea Surveys. Interview three or more people (any age) to identify problems for which you could find a logical or reasonable solution. • Read *You are an Inventor* (pp. 12-20) in Inventing Stuff. Learn ways to become an inventor and four different ways to invent new products. • Respond to your reading in your Daily Reflection Journal.	
Day 2	Morning	• Presentation Skills • Explore the forces of compression and tension • Understand strong shapes • Apply concepts • Introduce structural design concepts	• Brain Warmer: Share family interviews • Demonstrate compression and tension • Introduce and test strong shapes • Build Geo-domes with gumdrops and toothpicks
	Afternoon	• Develop team building skills • Develop critical and creative thinking • Reinforce structural design concepts • Develop planning skills • Review brainstorming and documentation skills	• Introduce Invention Convention project • Design an indestructible package to mail potato chips: Pringle Challenge!
	Homework	• Research one inventor and record the information on a tri-fold mobile • Read *Your Idea Factory* (pp. 22-32) in Inventing Stuff.	

		WHAT (skill goals, knowledge goals, concepts, & readings)	HOW (activities)
		Learn how you can help your brain organize your thinking. Learn techniques to develop ideas include asking questions, looking for patterns, brainstorming, using SCAMPER, listing attributes, drawing pictures, and keeping an idea file. • Respond to your reading in your Daily Reflection Journal • Add one idea to IDEA diary	
Day 3	Morning	• Understand physical properties and forces • Reinforce understanding through collaboration • Make improvements through testing	• Brain Warmer: Present Mobiles • Explore forces affecting bridge construction • Identify types of bridges
	Afternoon	• Use creative and critical thinking for problem solving • Documentation skills	• Design and construct a spaghetti and marshmallow bridge
	Homework	• Add a second idea to IDEA diary • Use your Invention Idea Surveys to do a Daily Reflection. Write a summary of your findings and your thoughts about your interviews. • Find a broken machine, appliance, or electrical device (e.g., clock radio, telephone, computer, toaster) and bring it to class for the invention dissection session.	
Day 4	Morning	• Use creative and critical thinking for problem solving • Cooperation and collaboration • Understanding Simple Machines • Documentation Skills	• Brain Warmer • Identify Simple Machines • Demonstrate Simple Machines (e.g., incline planes, wedges) • Diagram and label simple machines
	Afternoon	• Use creative and critical thinking for problem solving • Brainstorming • Collaboration • Documentation skills • Understanding simple machines	• View Junk Yard Wars video; identifying simple machines • Create and test mouse trap ping pong ball launchers
	Homework	• Add a third idea to IDEA diary and review all ideas to identify your idea for the invention convention • Gather ingredients for your new snack mix product (NO PEANUT PRODUCTS PLEASE) and bring them to class. • Read *Inventing Backwards* (pp. 34-37) in Inventing Stuff. • Respond to your reading in your Daily Reflection Journal	
Day 5 (Half day; July 4)	Morning	• Use creative and critical thinking skills • Documentation skills • Evaluation skills	• Brain Warmer • Create, sample, and evaluate your new snack mix product

		WHAT (skill goals, knowledge goals, concepts, & readings)	HOW (activities)
Day 6	Morning	• Reinforce classroom skills • Introduce the process and history of patents	• Brain Warmer • Field trip to U.S. Patent and Trademark Office
	Afternoon	• Documentation skills • Understanding and writing about patent process	• Debrief from Patent Office trip • Ancient inventions mystery pictures
	Homework	• Read *Invent by Solving Problems* (pp. 38-48) in Inventing Stuff. • Respond to your reading in your Daily Reflection Journal • Write the problem your invention is solving and the solution to the problem in your journal.	
Day 7	Morning	• Identify steps of the inventing process • Identify the meaning of SCAMPER • Apply information presented in SCAMPER • Identify design assets and flaws • Apply cost effective and environmentally sound practices	• Brain Warmer • Detailed explanation of the Invention Convention • Introduction to the invention process • Review SCAMPER • Design an improvement for an existing invention • Alternative power sources • Working as a team, design and a build solar power car
	Afternoon	• Identify design assets and flaws • Apply cost effective and environmentally sound practices	• Test, modify, retest, and evaluate your team's solar power car
	Homework	• Add one new idea to your Idea Diary • Choose your best idea that you will develop for our Invention Convention. • Make a plan of your invention	
Day 8	Morning	• Documentation skills • Creative and critical thinking • Define friction and types of friction • Problem solving skills • Team building skills • Long term planning	• Brain Warmer • Research types and effects of friction • Complete Invention Proposal
	Afternoon	• Documentation skills • Creative and critical thinking • Problem solving skills • Team building skills	• Design, build, test, modify, retest, and evaluate an air powered car
	Homework	• Read *Invent by Finding New Uses for Things* (pp. 50-71) in Inventing Stuff. • Response to your reading in your Daily Reflection Journal • Draw your final prototype of your invention	

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Day 9	Morning	• Bernoulli's Principle • Apply Bernoulli's Principle • Documentation skills • Compare and Contrast • Collaborate to build various types of airplanes	• Brain Warmer • Learn about Bernoulli's Principle • Describe how Bernoulli's Principle applies to airplanes • Design two types of paper airplanes and compare utilizing a Venn Diagram
	Afternoon	• Documentation skills • Procedural evaluation • Team building skills	• Apply concept of lift • Design and build complex hovercraft
	Homework	• Create a list of materials and procedural steps for your invention • Start designing and building your invention for our Invention Convention.	
Day 10	Morning	• Identify attributes of magnets • Identify types of magnets • Understand properties of electromagnets	• Brain Warmer • Explore magnets through research and testing
	Afternoon	• Incorporate information about magnets • Team building • Brainstorming	• Brainstorm elements of a game • Create a board game including objectives and rules • Complete and play board games including magnetic elements
	Homework	• Test your model or prototype for our Invention Convention • Record your results and data in a chart or graph in your journal • In your Reflection Journal, glue pictures or draw illustrations of your new invention	
Day 11	Morning	• Understand and identify electrical circuits • Identify elements of a light bulb	• Brain Warmer • Build electrical circuits including switches, light bulbs, and motors • Build a working light bulb
	Afternoon	• Identify electrical circuits • Collaboration • Documentation	• Deconstruction – take apart the machine, appliance, or electrical device you brought from home • Tally sheet of identified components
	Homework	• Continue to prepare your materials and procedural steps for your invention • Continue designing and building your invention for our Invention Convention	

		WHAT (skill goals, knowledge goals, concepts, & readings)	HOW (activities)
Day 12	Morning/ Afternoon	• Reinforce classroom skills • Apply principles of physical science to construction activities	• Brain Warmer • Field trip to the Baltimore Museum of Industry
	Homework	• Change your model or prototype based on test results and observations • Finalize the name and create an advertisement for your invention	
Day 13	Morning	• Become familiar with Rube Goldberg's cartoon inventions	• Brain Warmer • Who was Rube Goldberg? • Create a Rube Goldberg cartoon
	Afternoon	• Creative thinking skills • Problem solving skills	• Work as a team to create a Rube Goldberg contraption
	Homework	• Prepare Invention Convention speech. Include the problem, solution, how your invention works, the name of your invention, selling price, and advertisement. Be sure to practice in front of a mirror and a family member.	
Day 14	Morning	• Prepare for Invention Convention	• Design and complete display board
	Afternoon	• Reflect on CTY experience • Prepare for Invention Convention	• Complete post-assessment • Present Invention to Classmates
	Homework	• Practice speech for our Invention Convention	
Day 15	Morning	• Culminating activity	• CTY classes tour the Invention Convention
	Afternoon	• Culminating activity	• Families visit the Invention Convention