

Project 4.1 Puzzle Design Challenge Rubric

Elements	Weight	5 Points	4 Points	3 Points	2 Points	1-0 Points	Total
Activity 4.1a Puzzle Part Combinations							
Puzzle Parts		Multiple combinations of three, four, five and six blocks.	Multiple combinations of three, four, five or six blocks.	Some combinations of three, four, five or six blocks.	Combinations restricted to three, four, five or six blocks.	Combinations other than three, four, five or six blocks.	
Documentation		Student signed and dated each combination.	Student signed and dated most combinations.	Student only signed or dated most combinations.	Student signed and dated a few combinations.	Student did not sign and dated each combination.	
Sketching Technique		Shows excellent line quality. Lines are straight, follow the isometric grid paper and are of the correct line weight.	Shows good line quality. Lines are fairly straight, follow the isometric grid paper and of the correct line weight.	Shows fair line quality. Lines are fairly straight, stray from the isometric grid paper and vary in thickness.	Shows fair line quality. Lines are not straight, stray from the isometric grid paper and vary in thickness.	Lines are feathered; straight lines appear as curves. Lines converge.	
Proportion		Elements are sized correctly and communicated effectively.	Most elements are sized correctly and communicate the design in an acceptable manner.	Some elements are sized correctly and communicate the design in an acceptable manner.	Elements are close to the correct relationship with some distortion.	Elements have no relationship with each other. Detail is difficult to ascertain.	
Color		Color is appropriately applied. Color enhances the image.	Color is applied. The color does make the visual appearance of the object pleasing to the eye.	Color is applied and does not distract from the three dimensional image.	Color is applied. The color needs improvement.	Color detracts from the three dimensional image	

Activity 4.1b Graphical Modeling Puzzle Cube Combination Isometric Sketches							
Puzzle Cube Combinations		Two combinations with ten unique parts. Each of the five component parts clearly shows how they fit together.	Two combinations with less than ten unique parts. Each of the five component parts somewhat shows how they fit together.	One combination with ten unique parts. Each of the five component parts clearly shows how they fit together.	One combination with less than ten unique parts. Each of the five component parts somewhat shows how they fit together.	One combination with less than ten unique parts. Difficult to determine how component parts fit together.	
Consideration of Alternatives		Selects most appropriate concept and clearly justifies the choice using the appropriate criteria.	Selects an appropriate concept and is somewhat able to justify the choice using some acceptable criteria.	Selects an appropriate concept and is somewhat able to justify the choice using marginally acceptable criteria.	Selects one using inadequate criteria.	No clear selection or criteria stated.	
Documentation		Student signed and dated each combination.	Student signed and dated most combinations.	Student only signed or dated most combinations.	Student signed and dated a few combinations.	Student did not sign and dated each combination.	
Sketching Technique		Shows excellent line quality. Lines are straight, follow the isometric grid paper and are of the correct line weight.	Shows good line quality. Lines are fairly straight, follow the isometric grid paper and of the correct line weight.	Shows fair line quality. Lines are fairly straight, stray from the isometric grid paper and vary in thickness.	Shows fair line quality. Lines are not straight, stray from the isometric grid paper and vary in thickness.	Lines are feathered; straight lines appear as curves. Lines converge.	
Proportion		Elements are sized correctly and communicated effectively.	Most elements are sized correctly and communicate the design in an acceptable manner.	Some elements are sized correctly and communicate the design in an acceptable manner.	Elements are close to the correct relationship with some distortion.	Elements have no relationship with each other. Detail is difficult to ascertain.	
Color		Color is appropriately applied. Color enhances the image.	Color is applied. The color does make the visual appearance of the object pleasing to the eye.	Color is applied and does not distract from the three dimensional image.	Color is applied. The color needs improvement.	Color detracts from the three dimensional image	
Activity 4.1b Graphical Modeling Puzzle Cube Multi-View Drawings of Selected Design							

Multi-View Drawings of Selected Design		Drawing includes all five puzzle pieces.	Drawing includes four puzzle pieces.	Drawing includes three puzzle pieces.	Drawing includes two puzzle pieces.	Drawing includes one puzzle piece.	
Sketching Technique		Shows excellent line quality. Lines are straight, follow the orthographic grid paper and are of the correct line weight. Best front view chosen. All object and hidden lines included. Joints between individual wooden cubes not shown.	Shows good line quality. Lines are fairly straight, follow the orthographic grid paper and of the correct line weight. Best front view chosen. Most object and hidden lines included. Joints between individual wooden cubes not shown.	Shows fair line quality. Lines are fairly straight, stray from the orthographic grid paper and vary in thickness. Front view chosen is fair. Most object and hidden lines included. Joints between individual wooden cubes sometimes shown.	Shows fair line quality. Lines are not straight, stray from the orthographic grid paper and vary in thickness. Front view chosen is fair. Most object and hidden lines included. Joints between individual wooden cubes often shown.	Lines are feathered; straight lines appear as curves. Lines converge. Front view chosen is inadequate. Some object and hidden lines included. Joints between individual wooden cubes often shown.	
Proportion		Elements are sized correctly and communicated effectively.	Most elements are sized correctly and communicate the design in an acceptable manner.	Some elements are sized correctly and communicate the design in an acceptable manner.	Elements are close to the correct relationship with some distortion.	Elements have no relationship with each other. Detail is difficult to ascertain.	
Geometry		Shapes are correct; rectangles have 90° corners.	Shapes are close to correct; rectangles have close to 90° corners.	Shapes are recognizable; rectangle corners are close to 90°.	Shapes are recognizable; rectangle corners vary from 90°.	Shapes are confusing; rectangle corners not consistent or close to 90°.	
Feedback		Appropriate feedback given for all criteria listed.	Appropriate feedback given for most criteria listed.	Adequate feedback given for some criteria listed.	Some feedback given for some criteria listed.	Inadequate feedback given.	

Puzzle Cube CAD Modeling							
Model Generation		Presents, locates, and sizes all model features properly. Model is completely and efficiently constrained.	Presents, locates, and sizes most model features properly. Model is partially constrained or missing a few constraints.	Presents, locates, and sizes some model features properly. Model is inefficiently constrained or missing a few constraints.	Some model features are missing or improper. Model is missing several constraints.	Model is missing most features or constraints.	
Dimensions and Annotation		Dimensions and annotates properly and clearly.	Supplies most dimensions and annotations. Locates most of them properly.	Supplies some dimensions and annotations. Locates some of them properly.	Omits many dimensions or annotations. Some mislabeling.	Dimensions or annotations have not been added, leaving only software determined defaults.	
Views		Locates all appropriate views properly and clearly. Uses appropriate number of views.	Locates most appropriate views properly and clearly. Number of views fair.	Does not locate all appropriate views clearly or properly	Omits views needed for clarity. Includes inappropriate views.	Incomplete drawing submitted.	

Puzzle Cube Construction and Statistics							
Construction		Puzzle constructed with care. Blocks all in alignment and fully adhered to adjacent block.	Puzzle constructed with care. Blocks mostly in alignment and fully adhered to adjacent block.	Puzzle constructed with adequate care. Blocks somewhat in alignment and fully adhered to adjacent block.	Puzzle constructed with some care. Blocks somewhat in alignment and somewhat adhered to adjacent block.	Puzzle constructed with little care.	
Color		Color is appropriately applied. Color enhances the puzzle. Color matches model.	Color is applied. The color does make the visual appearance of the puzzle pleasing to the eye. Color matches model.	Color is applied and does not distract from the three dimensional puzzle. Color mostly matches model.	Color is applied. The color needs improvement. Color somewhat matches model.	Color detracts from the puzzle. Color does not match model.	
Feedback		Appropriate feedback given.	Adequate feedback given.	Some feedback given.	Little feedback given.	Inadequate feedback given.	
Testing		10 or more subjects tested. Appropriate data accurately recorded.	6-10 subjects tested. Appropriate data accurately recorded.	4-6 subjects tested. Appropriate data mostly recorded.	<6 subjects tested. Some data recorded.	Little or no data recorded.	
Analysis		Calculates and accurately presents all statistics related to testing.	Calculates and accurately presents most statistics related to testing.	Calculates and accurately presents some statistics related to testing.	Calculates, but accurately presents some statistics related to testing.	Little or no analysis done.	
Optimization		Appropriate recommendations for improvement.	Adequate recommendations for improvement.	Some recommendations for improvement.	Unclear recommendations for improvement.	Little or no recommendations for improvement.	