Appendix G

Test Subject Pop-up Analysis

Two sets of tables for each user are included here. The first table focuses on the elements produced for each pop-up with the software. Totals for each of the five types of elements are given for each pop-up, along with the highest level of the top element. If additional levels are added by adding other elements (including attached planes) by hand, the highest level in the completed pop-up is given in parentheses. An attached plane on an element is considered to add a level. The pop-ups are identified by name and also by reference to the photos in Appendix F.

The second set of tables concentrates on decoration and symmetry. It includes details of how the pop-up was decorated, both the use of art materials and added materials such as sequins and googly eyes. In addition, where the student got the ideas for the pop-up (if known) and any added elements (including attached planes) or alterations of the computer-generated elements are listed. Finally, these tables indicate the symmetry of the pop-up as follows:

S Original design symmetric, and symmetric when complete

A Original design asymmetric

St Original design symmetric, but turned on its side when complete, making it asymmetric

Sd Original design symmetric, but added decoration or elements later makes it asymmetric

Original design means the design elements as made in software, or cut by hand if no software is used. Sd and St are of course not mutually exclusive.

Pop-up (and Figure reference)	Beaks	Steps	Angled Steps	V-folds	Tents	Top level
Alien (F.1 left)	17	5	3			3
Bird (F.1 right)	2	1	1	2		2
Abstract face with yarn 1 (F.6 top left)	2	2	2		3	2
Abstract face with yarn 2 (F.6 top right)	5	4	1			3
Abstract (F.2 right)	2	5	4			3
Owl (F.5)				1		1(2)
Blue and white abstract (F.6 bottom)	3	12	4			4

Table G.1: Daisy: Software-Produced Elements. Elements or other additions added by hand are not included.

Pop-up (and Figure reference)	Beaks	Steps	Angled Steps	V-folds	Tents	Top level
Frog (F.7 left)						0(1)
Blue Boxes (F.7 right)		1			1	1
Bunny's Picnic (F.8)				1		1
White abstract (F.9 top)	4	3	1			3
Bunny and Castle (F.9 bottom)				1	1	2(3)
Turtle Gymnast (F.10 top)				1		1
Mommy and Baby Bunny Houses (F.10 middle left)		1	1			1
Bunny and Her Houses (F.10 bottom)						0(1)
White Alien (F.10 middle right)						0(1)
Bunny Gymnast (F.11 left)				1		1
Bunny and Turtle's Castle (F.12)	2				1	1(3)
White abstract (F.13 left)	5					2
Flag (F.13 right)		1				1
Totem Pole (F.14)	3	1	2			2

Table G.2: Ursula: Software-Produced Elements. Elements or other additions added by hand are not included.

Pop-up (and Figure reference)	Beaks	Steps	Angled Steps	V-folds	Tents	Top level
Alien and His Ship (F.15)						0(2)
Man with a Cold (F.16 top)						0(1)
Green and Yellow abstract (F.17 top left)	1	4				2
Alien and Ship (F.17 top right)						0(1)
Volcano Camp (F.17 bottom)					1	1(2)
City (F.18)	1	2	1			1
Unfinished Mountain Scene (F.19)				3		1

Table G.3: Richard: Software-Produced Elements. Elements or other additions added by hand are not included.

Pop-up (and Figure reference)	Beaks	Steps	Angled Steps	V-folds	Tents	Top level
Abstract Face (F.21 top)	1	2	2		2	2
Table and Chairs (F.22 top)		2		3		1(2)
Campground (F.23)				1	2	2(3)
Sun and Tree (F.25)		1		1		1(2)

Table G.4: Peggy: Software-Produced Elements. Elements or other additions added by hand are not included.

Pop-up (and Figure reference)	Beaks	Steps	Angled Steps	V-folds	Tents	Top level
Freddy Squarehead (F.27 left)	1	1	2			2
Cinnamon the Cat (F.27 right)	2	1				3(2)
Mr. Mousy (F.28 top)	1				1	1(2)
Tweedy Mo (F.29)			1	1		2
Howard the Giraffe (F.30)		1				1(2)
Tap-dancing Cow #47 (F.31)				2		1(2)
Moosy McMooseMoose (F.34 top)		1				1(2)
Bart the Elephant (F.36)	1			1		1(4)
Slide of Ignorance (F.37)						0(2)
Unfinished abstract (F.38)	2	3	1			2

Table G.5: Emily: Software-Produced Elements. Elements or other additions added by hand are not included.

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Alien (F.1 left)		Computer coloring, googly eyes	S	Playing with software
Bird (F.1 right)		Computer coloring, googly eyes, feather	S	Playing with software
Abstract face with yarn 1 (F.6 top left)		Computer coloring, googly eyes, yarn	S	Playing with software
Abstract face with yarn 2 (F.6 top right)		Computer coloring, googly eyes, yarn	S	Playing with software
Abstract (F.2 right)		Computer coloring	S	Playing with software
Owl (F.5)	Head, tail, wings, talons	Colored pencil	S	Idea of owl from book she was reading. Looked at several pop-up books for ideas on execution. Looked at owls on web.
Blue and white abstract (F.6 bottom)		Computer coloring	S	Playing with software

Table G.6: Decorative Features of Pop-ups Produced by Daisy.

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Frog (F.7 left)	All by hand: 1 beak	Computer coloring	S	A friend had made a frog and she wanted to know how to do it.
Blue Boxes (F.7 right)		Computer coloring	S	Playing with software
Bunny's Picnic (F.8)	Cut the v-fold to bunny shape	Crayon	Sd	Idea for bunny's picnic was her own, v-fold suggested by researcher as she was playing with software.
White abstract (F.9 top)			S	Playing with software
Bunny and Castle (F.9 bottom)	Cut top of v-fold for castle and attached plane for bunny.	crayon, eyes and jewels	A	Pop-up book for basic idea of castle. Wanted a separate bunny and researcher helped with implementation.

Table G.7: Decorative Features of Pop-ups Produced by Ursula (Sessions 1-3).

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Turtle Gymnast (F.10 top)		markers, eyes, sequin and feathers	S	Playing on computer, but also influenced by Bunny and Castle pop-up.
Mommy and Baby Bunny Houses (F.10 middle left)		computer coloring	S	Playing with software. Researcher suggested using the 90° elements for a design. She later named it.
Bunny and Her Houses (F.10 bottom)	All done by hand: 2 steps, doors cut, extra bunny glued on	pencil	Sd, St	Learning to make steps by hand. This was the result
White Alien (F.10 middle right)	All done by hand: 1 step, 1 beak	googly eyes	S	Practicing making steps and beaks by hand.

Table G.8: Decorative Features of Pop-ups Produced by Ursula (Session 4).

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Bunny Gymnast (F.11 left)	cut out top of v-fold to make bunny	googly eyes and crayon drawing	S	Wants to do something same as turtle gymnast, but with a bunny.
Bunny and Turtle's Castle (F.12)	attached castle with drawbridge and turtle added to it, and bunny in hole	crayon and pencil	Sd,St	Inspired by castle in Pop-o-Mania book.
White abstract (F.13 left)			S	Playing with software.
Flag (F.13 right)		crayon coloring	Sd	Veteran's Day was near, she wanted to do something for her teacher, and they had been learning about the flag.
Totem Pole (F.14)		feathers, eyes, sequins, marker	S	Playing with softaware

Table G.9: Decorative Features of Pop-ups Produced by Ursula (Sessions 5-8).

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Alien and His Ship (F.15)	All made by hand: 3 steps with attached planes	crayon coloring, sequins and feather	Sd, St	Researcher had heard that he had made pop-ups. Asked him to make one.
Man with a Cold (F.16 top)	All made by hand: cut out diamond shape (failed beak) and beak	gooly eyes, crayon drawing	Sd	Looking at Pop-o-mania book. Saw the beak. Took paper to try it. First one was the cut-out triangle, then did the second beak correctly.
Green and Yellow abstract (F.17 top left)		computer coloring	S	Playing with software. Made for his sister (he had seen abstracts she made.)
Alien and Ship (F.17 top right)	All made by hand: 1 step and 2 flaps	Crayon. Lettering done by researcher at his direction.	A	Wanted to do something quick. He made the step asymmetric and investigated where the fold ended up when page was folded.

Table G.10: Decorative Features of Pop-ups Produced by Richard (Sessions 1-3).

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Volcano Camp (F.17 bottom)	1 free-form element for lava	computer coloring, red paper and crayon	St, Sd	Had idea from shape of tent element for mountain, then volcano. Sketched it out first.
City (F.18)	2 flaps, doors and windows cut in step	Computer coloring and lines, colored paper and crayon, Lettering done by researcher at his direction.	A	Idea of city from Sabuda book, America. Playing with software for final form.
Unfinished Mountain Scene (F.19)	Top of one v-fold cut to make castle	not done when sessions over	Sd	Idea from Raggedy Ann book, mountain, castle and soldiers

Table G.11: Decorative Features of Pop-ups Produced by Richard (Sessions 3-5).

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Abstract Face (F.21 top)		Marker, googly eyes	S	Playing with software. Noticed face during that and refined it.
Table and Chairs (F.22 top)	Tabletop on one v-fold	Computer coloring, colored paper for tabletop	S	The shape of the v-fold when playing with the computer suggested a chair back to her.
Campground (F.23)	Trees and man on tent attached to a tent and the top of the fireplace and flames on one of the v-folds	Crayons	A	Shape of the tent suggested a campground. Reused table idea for campfire. Experimented by hand for man and trees.
Sun and Tree (F.25)	Sun wheel and slider, cloud on top of v-fold	Colored paper, markers, sequins, jewel	Sd	Elements of Pop-ups wheel attracted her. Pop-up book was inspiration for cloud, although it was changed in execution. Slider was from Pop-o-mania.

Table G.12: Decorative Features of Pop-ups Produced by Peggy.

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Freddy Squarehead (F.27 left)	Extended the top of the step to include hair	Computer coloring and lines	S	Playing with software
Cinnamon the Cat (F.27 right)	Extended the top of the step for ears, and rounded the bottom for chin. The double beak became single at the end. Double nose made 3 levels, but only folded 2.	markers and colored paper, computer coloring and lines	Sd	Likes cats and wanted a cat for Freddie. Playing with software for form
Mr. Mousy (F.28 top)	1 flap, paws on the tent, extended the step to make the ears	Computer coloring, lines, markers, colored paper	Sd	Decided on mouse for the cat to have for dinner. Her approach is to build up a story. Form is developed through playing with software.
Tweedy Mo (F.29)	Wings, 1 flap, extended angled step for head	Colored paper, markers, computer coloring	Sd	Continued the sad story of cat's food. Once again playing with software. Looks at pop-up books for ideas on wings.

Table G.13: Decorative Features of Pop-ups Produced by Emily (Sessions 1-4).

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Howard the Giraffe (F.30)	legs, and neck with head, 1 flap	Colored paper, computer coloring, markers	Sd	Thinking about animals in general.
Tap-dancing Cow #47 (F.31)	Head and body attached to v-folds, 1 flap	Markers, colored paper, computer coloring for background	Sd	Idea for cow to continue animals. Wants something "above the paper" Uses a pop-up book and discussions about what her sister did to plan v-folds.
Moosy McMooseMoose (F.34 top)	pull-tab mechanism, antlers	Computer coloring, lines, colored paper and markers	Sd	Idea of moose goes along with animal theme. For the pull-tab, looks at Elements of Pop-ups, Hiner, but largely result of prototyping, trial and error.

Table G.14: Decorative Features of Pop-ups Produced by Emily (Sessions 5-9).

Pop-up (and Figure reference)	Non-computer elements and alterations of computer elements	Decoration	Symmetry	Idea from
Bart the Elephant (F.36)	Extra piece around beak for head, 2 v-folds for ears, tusks. Characters attached to ears, Folded the v-fold for trunk	Computer coloring, markers, colored paper.	Sd	Wanted to present all the characters along with the last one. Looks at both Birmingham and pop-up book for ideas on execution. Some prototyping on ears.
Slide of Ignorance (F.37)	All by hand: Spiral, cut-out pieces for signs, ladder, characters, and head	Computer coloring (for base page) Colored paper, markers	A	Has basic idea going in, a final wrap-up of all the characters and wants to do a coil. (Seen in pop-up books)
Unfinished abstract (F.38)		Computer coloring	A	Playing with software

Table G.15: Decorative Features of Pop-ups Produced by Emily (Sessions 10-13).