Program Sampler

CONTENTS

OVERVIEW

Introduction 1

Curriculum Overview 2

STEM Standards Addressed 3

References 8

Sample Track: WELCOME DIVAS

Challenge 1: About Me Video 9

Challenge 2: About Me Collage 13

Sample Track: E-PAPER

Challenge 1: Color Wheel Collage 17

Challenge 2: Free Drawing 21

Challenge 3: Texture Flip Book 25

Challenge 4: e-Card Production 29

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Digital Youth Divas is directed by PI **Nichole Pinkard** (School of Education & Social Policy Northwestern University) and Co-PI **Sheena Erete** (College of Computing and Digital Media, DePaul University), and led by **Asia Roberson** (Project Manager) and **Caitlin K. Martin** (Research and Development).

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Overview

Introduction

The Digital Youth Divas (DYD) is a blended online and face-to-face program developed by the Digital Youth Network (DYN) along with faculty and students at DePaul University. The program is designed to engage middle-school-aged girls, particularly those from communities underrepresented in computer science and engineering disciplines, with computational circuitry and programming through fabrication and design. Digital Youth Divas is purposefully designed to impact girls' STEM identities, learning and knowledge outcomes, and sense of community. The primary program components include

(1) a set of scaffolded computational design and making **project challenges**;

(2) original **multimedia narrative stories** with diverse characters that prompt work and conversation, aligned with the projects;

(3) **adult facilitators (mentors and educators) and girls** working together in a regularly scheduled face-to-face setting; and

(4) an **online social learning network** where girls access instructions and resources, upload project work, and interact with others.

This program sampler offers an overview and suite of sample lesson plans. It is intended to give educators interested in implementing DYD a better sense of the program. This sampler has examples of project challenges and narrative stories but to have access to the community and online social learning network, please join us! Contact us through the program website or at info@digitalyouthnetwork.org.

Digital Youth Divas Content Overview

There are six core content tracks. Each track includes one or more narrative story modules. The narrative modules include a series of scaffolded challenges, the final of which is a culminating project. Narratives are shared in different media formats including video, audio, comic book, and text.

TRACK	NARRATIVE MODULES	DURATION (in hours)	CHALLENGES	CONTENT
Intro	Welcome Divas* [video]	3	About Me Video About Me Collage	Community building Computational identity Connections to preexisting knowledge and interest
ePaper	Jayla's Mystery Bash [comic book]	6	Color Wheel Collage Free Drawing Texture Flip Book e-Card	Color and design theory Conductivity 2D design Series circuit
eFashion	Roshonna's Choice* [video]	6	Color Theory Warm & Cool Color Rings Circuit Design Glowing Mood Flower	3D design Paper prototyping Series circuit Circuit modeling Switches
	Roshonna's Big Break [video]	15	Stitching Paper Prototype e-Cuff	
eDance	Team Fearless [audio]	10	Learn the Basic Moves Help Casey Find Her Voice Sylvia and the Quinceañera Amina's Story Dance Battle	Decomposition Procedural programming Parallel processing Iterative loops Automation
3D Design	3D Accessories [text PDF]	15	Jewelry Goals Board 3D Origami Tinker Bracelet Tinker Keychain 3D Jewelry Free Design	3D virtual design CAD
Graduation	Good Luck Divas! [text PDF]	6	About Me Now Video Graduation Skills Graduation and Beyond	Reflection on STEM identities Ideas for the future

STEM Standards Addressed

The Digital Youth Divas program uses a project-based learning approach, in which youth gain knowledge and skills by working for an extended period of time on engaging and complex challenges. Projects engage youth in computational making activities through cycles of design, critique and discussion, revision, and showcase. Projects are based on nationally recognized curriculum in computing and engineering (Indiana University Creativity Labs e-tangibles work, NSF grant #1420303, Peppler ***et al***, 2014) and the MIT Media Lab Scratch programming work, NSF grant #1348911, Resnick ***et al***, 2009).

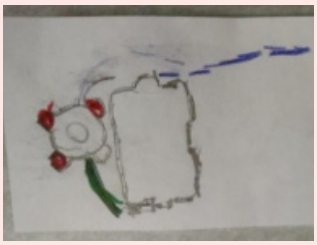
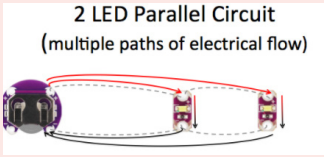
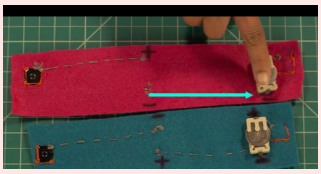
Computational thinking involves solving problems and designing systems by utilizing fundamental concepts of computer science. In computational making, youth work independently or collaboratively through a posed design challenge by breaking it down into smaller parts (decomposition), using digital and tangible tools to develop a project-based solution, and testing and debugging final work. Participation in computational making activities can lead to outcomes beyond the final artifact or the ability to use a new technology tool. Importantly, they can position youth as creators as opposed to simply consumers in the world. Other outcomes are linked to 21st century learning and capacities including the development of a creative identity, an innovative mindset, and social and technical skills and confidence.

The project work in the Digital Youth Divas program is aligned with computational thinking and other core practices called out as essential elements of K-12 science and engineering curriculum in the Next Generation Science Learning Standards (NGSS Lead States, 2013) and Common Core State Standards (Council of Chief State School Officers, 2010). It is also aligned with K12 Computer Science Framework (2016, led by the Association for Computing Machinery, Code.org, Computer Science Teachers Association, Cyber Innovation Center, and National Math and Science Initiative in partnership with states and districts) and ISTE Technology Standards for Students (2016). The following pages identify standards met at a program, practice, and modular content level.

Standards addressed at the program level. The primary components of the DYD program—project-based challenges, narratives, community, and online social network—are intentionally designed to address high level STEM standards.

COMPONENT	STANDARDS
Project-based challenges Set of scaffolded computational design and making projects (see tables 2 and 3 for specific project practice and content-related standards)	**ISTE Innovative Designer:** Use a variety of technologies with a design process to identify and solve problems by creating new, useful or imaginative solutions. **ISTE Empowered Learner:** Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals. **ISTE Computational Thinker:** Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. **ISTE Knowledge Constructor:** Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others. **K12CS Practice 3.** Recognizing and defining computational problems **K12CS Practice 5.** Creating computational artifacts **K12CS Practice 6.** Testing and refining computational artifacts **NGSS Practice 1.** Defining problems (for engineering) **NGSS Practice 2.** Developing and using models **NGSS Practice 5.** Using mathematics and computational thinking **NGSS Practice 6.** Designing solutions
Narratives Original multimedia narrative stories with diverse characters that prompt work and conversation, aligned with the projects	**ISTE Knowledge Constructor:** Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others. **ISTE Global Collaborator:** Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. **K12CS Practice 1.** Fostering an inclusive computing culture
Community Adult facilitators (mentors and educators) and girls working together in a regularly scheduled face-to-face setting	**ISTE Global Collaborator:** Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. **ISTE Empowered Learner:** Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals. **K12CS Practice 1.** Fostering an inclusive computing culture **K12CS Practice 2.** Collaborating around computing **K12CS Practice 7.** Communicating about computing **NGSS Practice 7.** Engaging in argument from evidence **NGSS Practice 8.** Obtaining, evaluating, and communicating information
Online Platform Online social learning network where girls access instructions and resources, upload project work, receive feedback, and interact with others	**ISTE Creative Communicator:** Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals. **ISTE Digital Citizen:** Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model it in ways that are safe, legal, and ethical. **K12CS Practice 7.** Communicating about computing **NGSS Practice 7.** Engaging in argument from evidence **NGSS Practice 8.** Obtaining, evaluating, and communicating information **K12CS grade 8 Impacts of computing.** Social interactions

Standards addressed at the practice level. The project-based model addresses specific science and engineering practices. The table below illustrates alignment using the DYD e-Cuff (Roshonna's Big Break) as a sample project challenge. In addition to aligning with STEM content and practice standards, this work also addresses youth **perceptions** of themselves and their communities as participants in computational practices. In the table, note that the animated characters are diverse in the video that sets up the design challenge; the hands are brown that instruct how to create the working series circuit; the troubleshooting expert is a smiling female in front of a colorful background; the online interface to submit work has curved lines and bright colors. These types of non-traditional (for computer science and engineering) visual elements and cues are consistent throughout the program components and across projects.

CHALLENGE PRACTICE	EXAMPLE FROM e-CUFF	STANDARDS
Identify problem 	Watch the narrative story video and establish the assignment from the problem that is set up in the story.	**NGSS practice 1.** Ask questions and define problems **ISTE Innovative Designer:** Use a variety of technologies with a design process to identify and solve problems by creating new, useful or imaginative solutions.
Prototype design ideas 	Create a paper design layout of the e-Cuff accessory. Using the front and back of paper, Identify design, electronic components, and positive and negative paths. Try out the prototype, and review and revise as needed.	**NGSS practice 2.** Develop and use models **MS-ETS1-1.** Define criteria and constraints of a design problem with precision to ensure successful solution. **MS-ETS1-4.** Develop a model for iterative testing and modification of a proposed object to achieve optimal design **CC.6-8.RST.7.** Integrate technical info expressed in a text with a version of that information expressed visually **ISTE Innovative Designer c.** Develop, test, and refine prototypes as part of a cyclical design process.
Use resources 	Explore embedded resources (PDF guides, PowerPoint slides with images and text) to think about options and solutions.	**CC.6-8.RST.4.** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
	Watch a step-by-step video showing how to put an e-Cuff together.	**CC.6-8.RST.3.** Follow precisely a multistep procedure when performing technical tasks. **CC.11-12.RST.9.** Synthesize info from a range of sources (e.g texts, experiments, simulations) into a coherent understanding of a process, resolving conflicting info when possible

continued >

Construct artifact

Work at collaborative tables with shared materials and online embedded resources to create the e-Cuff from the paper models.

MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

ISTE Innovative Designer: Use a variety of technologies with a design process to identify and solve problems by creating new, useful or imaginative solutions.

ISTE Empowered Learner: Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals.

K12CS Practice 5: Creating computational artifacts

Troubleshoot

Troubleshoot the e-Cuff. Use troubleshooting videos, featuring experts.

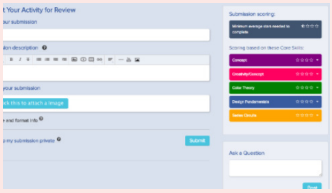
CC.K-12.MP.1. Make sense of problems and persevere in solving them.

NGSS Practice 5. Using mathematics and computational thinking

K12CS Practice 6. Testing and refining computational artifacts

K12CS grade 8 Computing Systems. Troubleshooting

Share and reflect



Upload a picture of your design to the online site.

Include a description of how it works and why, as written to the story character who posed the initial design challenge.

NGSS practice 8. Communicating information

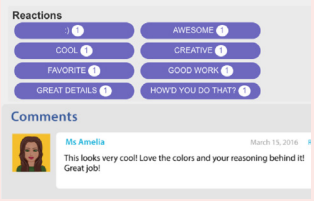
CC.6-8.WHST.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task purpose, and audience

CC.6-8.WHST.6. Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

K12CS Practice 7. Communicating about computing

ISTE Creative Communicator d. Publish or present content that customizes the message and medium for their intended audience.

Give and receive feedback



Look at the projects submitted by your peers and offer constructive feedback.

K12CS Practice 2. Collaborating around computing

ISTE Empowered learner c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of way

Standards addressed at the modular level. Additional focal STEM standards found in individual activities and challenges over the course of the five tracks that make up the DYD core program are shared below.

Modules with an asterisk (*) can be downloaded as a PDF sampler.

TRACK	NARRATIVE MODULES	CHALLENGES	CONTENT
Intro	Welcome Divas* [video]	About Me Video About Me Collage	**K12CS Practice 1.** Fostering an inclusive computing culture **ISTE Digital Citizen a.** Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
ePaper	Jayla's Mystery Bash [comic book]	Color Wheel Collage Free Drawing Texture Flip Book e-Card	**NGSS PS3B:** Conservation of Energy and Energy Transfer
eFashion	Roshonna's Choice* [video]	Color Theory Warm & Cool Color Rings Circuit Design Glowing Mood Flower	**NGSS PS3B:** Conservation of Energy and Energy Transfer
	Roshonna's Big Break [video]	Stitching Paper Prototype e-Cuff	
eDance	Team Fearless [audio]	Learn the Basic Moves Help Casey Find Her Voice Sylvia and the Quinceañera Amina's Story Dance Battle	**K12CS grade 8 Algorithms and Programming.** Variables, Control (loops, event handlers, conditionals), Modularity **ISTE Computational thinker d.** Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions
Graduation	Good Luck Divas! [text PDF]	About Me Now Video Graduation Skills Graduation and Beyond	**K12CS Practice 1.** Fostering an inclusive computing culture **ISTE Digital Citizen a.** Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.

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K–12 Computer Science Framework. (2016). Retrieved from http://www.k12cs.org.

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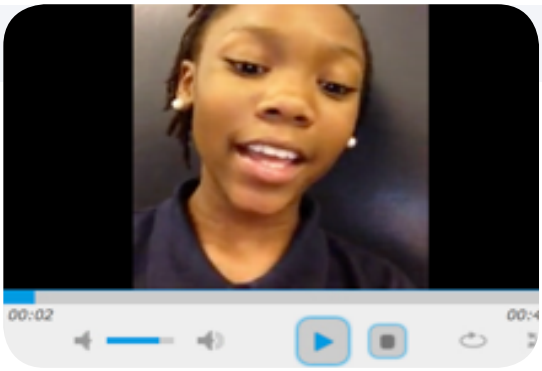
NGSS Lead States. (2013). Next Generation Science Standards: For States, By States. Washington, DC: The National Academies Press.

Peppler, K., Gresalfi, M., Salen, K., et al. (2014). *Soft Circuits: Crafting Efashion with DIY Electronics*. Cambridge, MA: MIT Press.

Resnick, M., Maloney, J., Monroy-Hernández, A., Rusk, N., Eastmond, E., Brennan, K., ... & Kafai, Y. (2009). Scratch: programming for all. *Communications of the ACM*, 52(11), 60-67.

WELCOME DIVAS

CHALLENGE 1: About Me Video



Session Duration

60-90 minutes

Learning Intentions & Outcomes

1. Learners become familiar with the goals of the program and expectations for participants.
2. Community (learners and adults) is introduced to the Divas narrative and watch the first video installment.
3. Community members are introduced to each other and the learning environment.
4. Learners reflect on who they are at this point in time, including who they are as STEM learners.
5. Learners understand how to use and respect classroom equipment
6. Learners become familiar with basic video production equipment and shoot and export and share a short video about themselves.

Challenge Description

Create a autobiographical video that will help students introduce themselves to their cohort and lead them to reflect on who they are right now.

Equipment & Materials

- ☐ Video recording device
- ☐ Note cards or Post-it Notes
- ☐ Blank paper
- ☐ List of questions that help students discuss themselves

SCHEDULE

Introduction (20 mins)

1 Introduce yourself and any other instructors

2 Short program intro, showing completed project challenges

3 Ice **Breaker** activity:

- Choose 1 or 2 games to play with students.

4 Post it activity

- Each girl receives post it notes. Answer the following questions on post it's:

  - First Name, Last Name, Grade, Age, Email (if applicable)
  - What do you think you'll learn in Digital Divas?
  - What do you hope to learn in Digital Divas.

- Give willing participants a chance to share and discuss what they've written with the group.

Note to facilitator: Post-it notes should be collected.

Watch *Welcome Divas* Narrative (10 mins)

1 Watch *Welcome Divas* narrative (10 mins)

https://www.youtube.com/watch?v=lgXLWHpGcjk

- Help girls make connections to story by having them answer the questions at the conclusion of the narrative.

- **What does a computer scientist look like, talk about, dress like, etc?**
- **What does a Diva look like, talk about, dress like, etc?**
- **How are they different? How are they the same?**
- **Why do we call the program Digital Divas?**

- Explain to participants that Divas will combine fashion design and circuitry.

Create *About Me* Video (30-60 mins)

1 Create Outline (10 mins)

- Give students a few minutes to write out information about themselves. If they do not know where to start have them answer questions about themselves.

- **What's your favorite thing about yourself?**
- **What's your favorite hobby?**
- **What's your family like?**
- **What's your favorite movie/song/book?**
- **How would you describe yourself in terms of science and technology? *What is your expertise? What are you interested in? What do you want to learn or do next?***

- Give each student a sheet of paper and begin writing an outline to be used during video recording.

2 Video Record (10-40 mins)

- Students should use the outline created as a guide to video recording.
- Advise students to record in a quiet location.
- Students should use a video recording device to record their About Me video. Student can add music, effects, titles, images, and transitions if skill and time permit.

3 Share Out & Clean Up (10 mins)

WELCOME DIVAS

CHALLENGE 2: About Me Collage

Session Duration

60-90 minutes

Learning Intentions & Outcomes

1. Community (learners and adults) will review and discuss Divas characters and previous narrative
2. Community will continue to get to know each other and reflect on their own interests
3. Learners will tinker with 3V batteries and LEDs through the creation of an About Me collage

Challenge Description

Building on the information provided in the About Me autobiographical video, girls use collaging techniques and an LED to create a collage that lights up.

Equipment & Materials

- ☐ 3V batteries
- ☐ LEDs
- ☐ Construction paper
- ☐ White paper
- ☐ Magazines
- ☐ Scissors
- ☐ Glue/tape
- ☐ Duct tape
- ☐ Craft supplies

SCHEDULE

Reflection and Narrative (15 mins)

1 Recap and reflect on project work

- **What did you create?**
- **How'd you feel about what you created?**

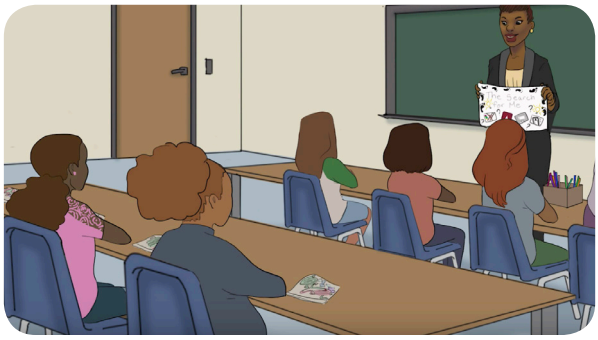
- Students should have 5-8 minutes to look at what some else created previously and offer a comment. The following question can be used as a critique prompt:

- **What do you like about the video? Why? Compare and contrast with your own video?**

- Choose students to share the work of others and their critique.

2 Recap and discussion of narrative from last week

- **What happened in the previous story?**
- **What characters were involved?**
- **Did anything happen in the story that you've experienced in your life?**
- **Are the characters familiar to you? What do you think about them?**
- **What do you think about the existence of an all-girls technology club?**



Create *About Me* Collage (45-75 mins)

1 Project intro (5-10 mins)

- Show an example of an "About Me" collage and explain that they will create one using construction paper, magazine cut-outs, tape, an LED, and a 3V battery..
- The point of emphasis is the place you want draw attention first. For the "About Me" collage the LED will be the point of emphasis.
- Give students 1 LED and 1 3V battery. Ask them to make the LED light up (time them 60 seconds).
- Continue to show students an example of your "About Me" collage and explain how it represents you and where the point of emphasis is located.

2 Brainstorm (5-10 mins)

- Give each girl a sheet of paper and have them choose one the following questions and write down answers and how to express those answers visually:

- **What's your favorite thing about yourself?**
- **What's your favorite hobby? How do you spend your time?**
- **What's your family like?**
- **What's your favorite movie/song/book?**

3 Design (20-35 mins)

- Arrange all materials on the tables.
- Encourage girls to assemble their collages that represent who they are by finding and cutting out images and taping them to the paper or drawing pictures.
- Girls should select the spot in the collage that is the point of emphasis, for the LED light, and poke a hole through the construction paper in that place.
- Girls bend the LED legs to lay flat against the paper on the backside of the collage in order to tape the LED and 3V battery down to the image (use duct tape here).

4 Share Out & Clean Up (15-20 mins)

E-PAPER

CHALLENGE 1: Color Wheel Collage

Session Duration

60-90 minutes

Learning Intentions & Outcomes

1. Learners are introduced to the foundations of color theory through collaging
2. Community (learners and adults) read the first chapter of *Jayla's Mystery Bash* and answer reflection questions around social responsibility and design
3. Learners understand how to use different type of materials to mix and create new colors
4. Learners complete the Color Wheel Collage challenge, a visual representation of colors arranged according to their chromatic relationship

Challenge Description

The character Jayla needs help creating the color pallet for her "Save the date" cards. The girls are asked to help by creating a collage color wheel using magazine cut outs.

Equipment & Materials

- ☐ *Jayla's Mystery Bash* comic https://goo.gl/vqFynp
- ☐ Magazines
- ☐ Scissors
- ☐ Glue
- ☐ Color Wheel template
- ☐ Color Wheel examples

SCHEDULE

Reflection and Narrative (30-40 mins)

1 Recap and reflect on previous session and work (15-20 mins)

- **What did you create?**
- **How'd you feel about what you created?**

- Students should have 5-8 minutes to look at what some else made and offer a comment. The following question can be used as a critique prompt:

- **What do you like about the work? Why?**

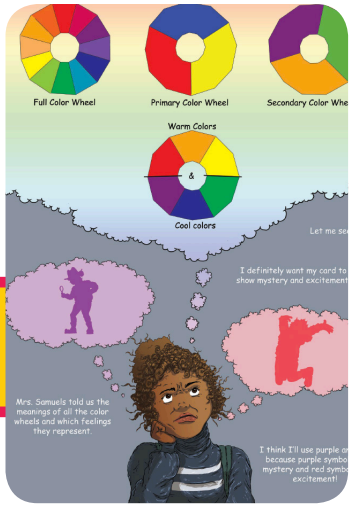
- Choose students to share the work of others and their critique

2 Introduce and read *Jayla's Mystery Bash* Chapter 1 (15-20 mins)

Note to facilitator: To ensure that students understand the flow of comic book format, read the first two pages to students.

- Assign students to read as a character.
- Help students make connections to story by having them answer the questions at the conclusion of the narrative chapter (p. 5).
- Encourage further discussion around being polite, why Jayla reacted to Milwaukee negatively and how this behavior appears in their lives.
- Discuss color theory and mixing colors

https://goo.gl/vqFynp



Create Color Wheel Collage (30-50 mins)

See Jayla's Mystery Bash comic book pages 4-5

1 Show an Example (5-10 mins)

- Show students an example of the Color Wheel collage and explain how to use different color papers to make one color (tiny yellow clippings mixed with tiny blue clippings will appear green).

2 Design (20-30 mins)

- Distribute blank color wheel templates to each girl and provide magazines to cut images from.

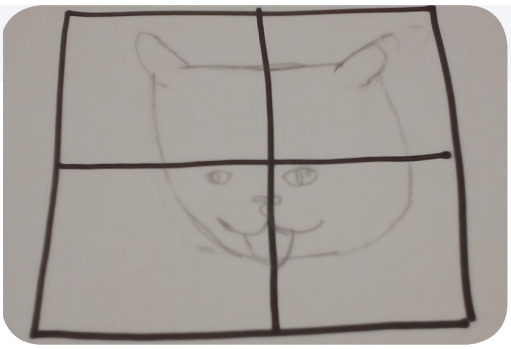
Blank color wheel template: https://goo.gl/8AYfQ2

- Have students search and cut images based on the colors needed for the color wheel template.
- Glue clippings onto appropriate color section of the template.

3 Share Out & Clean Up (5-10 mins)

E-PAPER

CHALLENGE 2: Free Drawing



Session Duration

60 minutes

Learning Intentions & Outcomes

1. Learners are introduced to the method of using a grid to draw, and concepts of positive and negative space
2. Community (learners and adults) read the second chapter of Jayla's Mystery Bash and answer reflection questions around social responsibility and design

Challenge Description

In this challenge, the girls help Jayla practice her visual design skills by drawing an original piece of visual art using a grid that both separates and connects elements in their design, exploring positive and negative space.

Equipment & Materials

- ☐ Jayla's Mystery Bash comic https://goo.gl/vqFynp
- ☐ Pencils
- ☐ Colored Pencils, markers, crayons
- ☐ White paper (for drawing and flipbooks)
- ☐ Images to for drawings

SCHEDULE

Reflection and Narrative (30 mins)

1 Recap and reflect on previous session and work (10 mins)

- **What did you create?**
- **How'd you feel about what you created?**

- Students should have 5 minutes to look at what some else made and offer a comment. The following question can be used as a critique prompt:

- **What do you like about the work? Why?**

- Choose students to share the work of others and their critique

2 Recap *Jayla's Mystery Bash* Chapter 1 (5 mins)

- **What happened in the previous story?**
- **What characters were involved?**

3 Read *Jayla's Mystery Bash* Chapter 2 (15 mins)

- After reading discuss what happened in the story:

- **What characters were involved**
- **Did anything happen in the story you've experienced in your life?**
- **What do you think you'll be creating to help the characters in the story?**

- Help students make connections to story by having them answer questions at the conclusion of the chapter (p. 11).

https://goo.gl/vqFynp

Complete Drawing Activities (30 mins)

See Jayla's Mystery Bash comic book pages 10-11

1 Complete Cat Drawing Activity *[page 11]* (10 mins)

- Examine how the image of the cat is broken into a 4 square grid.
- Recreate the grid on a separate sheet of white paper.
- Draw each element in the picture that is within its respective grid box

2 Complete Free Drawing Activity (10 mins)

- Students choose an image
- Draw grid lines onto the chosen image
- Draw the same grid on a separate sheet of paper
- Draw each element in the picture that is within its respective grid box

Note to facilitator: As students are drawing, ask questions around the importance of drawing and how drawing and use of space relates to design.

3 Share Out & Clean Up (10 mins)

E-PAPER

CHALLENGE 3: Texture Flip Book

Session Duration

70 minutes

Learning Intentions & Outcomes

1. Learners understand how to identify and describe different textures
2. Community (learners and adults) read the third chapter of Jayla's Mystery Bash and answer reflection questions around social responsibility and design

Challenge Description

In this challenge, the girls help Jayla by creating a texture flip book. The flip book is a series of assembled pages with different found textures with descriptive labels. Girls also create a video showing the book and describing why they chose the textures.

Equipment & Materials

- ☐ Jayla's Mystery Bash comic https://goo.gl/vqFynp
- ☐ Scissors
- ☐ Glue
- ☐ White Paper
- ☐ Texture samples
- ☐ Markers/crayons/colored pencils
- ☐ Foldable book Instructions
- ☐ Flip Book Example

SCHEDULE

Reflection and Narrative (30 mins)

1 Recap and reflect on previous session and work (10 mins)

- **What did you create?**
- **How'd you feel about what you created?**

- Students should have 5 minutes to look at what some else made and offer a comment. The following question can be used as a critique prompt:

- **What do you like about the work? Why?**

- Choose students to share the work of others and their critique

1 Recap *Jayla's Mystery Bash* Chapter 2 (5 mins)

- **What happened in the previous story?**
- **What characters were involved?**

2 Read *Jayla's Mystery Bash* Chapter 3 (15 mins)

- After reading discuss what happened in the story

- **What characters were involved**
- **Did anything happen in the story you've experienced in your life?**
- **What do you think you'll be creating to help the characters in the story?**

- Help students make connections to story by having them answer questions at the conclusion of the chapter (p. 16)

https://goo.gl/vqFynp

Create Texture Flip Book (40 mins)

See Jayla's Mystery Bash comic book pages 15-16

1 Texture Scavenger Hunt Activity (15 mins)

- If weather permits students should go on a texture scavenger hunt to find & collect different textures for their flip book. If students have never been on a scavenger hunt click on the file and read the rules of a scavenger hunt.

http://www.kidsdiscover.com/teacherresources/scavenger-hunt-for-kids/

- If weather does not permit, create a bag or box with a variety of textures in it (sponges, felt, fur, brillo, paper, etc).
- Students should find or choose up to 8 texture examples.

2 Design (20 mins)

- Use the Foldable book.pdf. You will need one piece of 8.5 x 11 paper and scissors.

https://www.filepicker.io/api/file/TnlYMzfYQXe4yiZJthRA

- Complete your book with the textures, label each (use a glue stick or tape to attach your texture to each page).
- Label each texture based on how it feels (i.e., soft, scratchy, silky, etc).
- If applicable, students should create a video showing your book & describing why you chose this topic and the textures on the pages. Explain if the textures are real or implied and how they feel, look. Be sure to tell Jayla why your chosen textures are important for seeing and feeling.

3 Share Out & Clean Up (5 mins)

E-PAPER

CHALLENGE 4: e-Card Production

Session Duration

1-2 hours

Learning Intentions & Outcomes

1. Learners are introduced to the basic concepts of electricity and circuitry and can draw a series circuit diagram
2. Community (learners and adults) read the final chapter of *Jayla's Mystery Bash* and answer reflection questions
3. Learners will understand how to use conductive materials, a battery, and an LED light to create a working circuit
4. Learners will use their knowledge of circuitry and design to complete a working e-Card challenge

Challenge Description

Girls design an invitation for Jayla's Mystery Bash, and assemble it as an e-card, including a battery-powered LED light.

Equipment & Materials

- ☐ *Jayla's Mystery Bash* comic https://goo.gl/vqFynp
- ☐ Magazines
- ☐ Scissors
- ☐ Glue
- ☐ Copper Tape
- ☐ 3V Batteries
- ☐ LEDs
- ☐ Needle Nose Pliers
- ☐ Cardstock in Assorted Colors
- ☐ Scotch Tape
- ☐ Toothpick or Awl Tool (or anything that can poke small holes)
- ☐ Markers/crayons/colored pencils
- ☐ Paper Prototype Practice Sheet (in *Jayla's Mystery Bash* comic)
- ☐ E-Card Step-by-Step Instructions
- ☐ Polarity Image (p. 31)
- ☐ Student made color wheel collage & texture flip book

SCHEDULE

Reflection and Narrative (20 mins)

1 Recap and reflect on previous session and work

- **What did you create?**
- **How'd you feel about what you created?**

- Students should have 5-8 minutes to look at what some else made and offer a comment. The following question can be used as a critique prompt:

- **What do you like about the work? Why?**

- Choose students to share the work of others and their critique

1 Recap *Jayla's Mystery Bash* Chapter 3

- **What happened in the previous story?**
- **What characters were involved?**

2 Read *Jayla's Mystery Bash* Chapter 4

- After reading discuss what happened in the story

- **What characters were involved**
- **Did anything happen in the story you've experienced in your life?**
- **What do you think you'll be creating to help the characters in the story?**

- Help students make connections to story by having them answer questions at the conclusion of the chapter (p. 23)

https://goo.gl/vqFynp

Chapter Activity Catchup and Narrative Review

1 Catch up on Activities

- Allow students time to review and complete any activities from Chapters 1-3
- Review the Chapter narrative reflection questions together and discuss answers

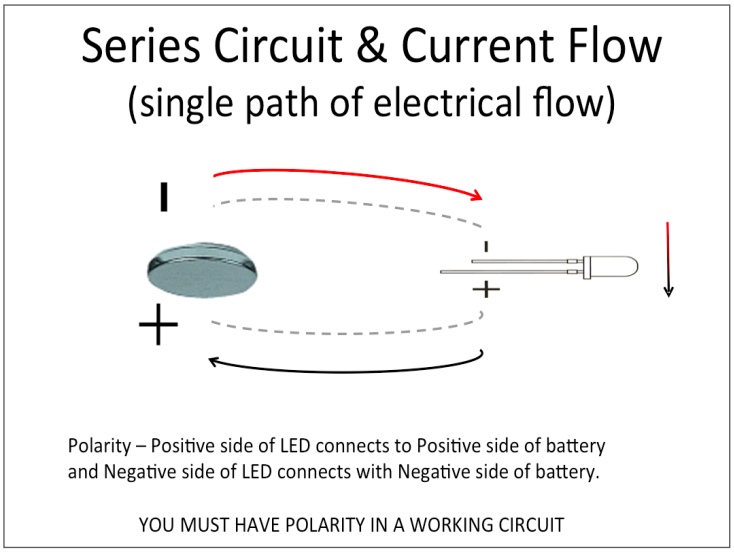
Introduce Circuitry

1 Discuss Current Flow

- Discuss the concept of electricity [see link to video]

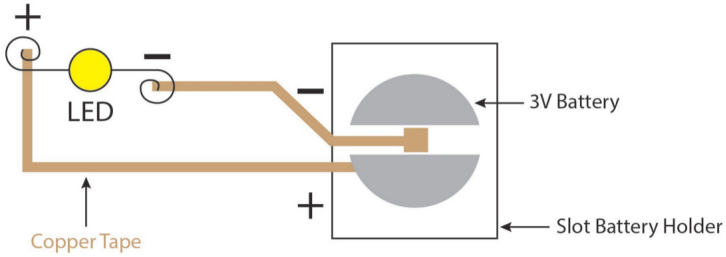
https://goo.gl/wZ9Das

- Show students the polarity Image and discuss circuit and current flow



2 Draw Circuit Diagrams

- On a separate sheet of paper students to recreate the image that represents the e-Card circuit (see Jayla's Mystery Bash p. 23).



- Ask students to practice making lines of polarity for a working circuit.
- Use a light-colored marker to trace the path that will connect the positive LED leg to the positive side of battery. Use a dark-colored marker to trace the path that will connect the negative LED leg to the negative side of battery.

Note to facilitator: Ask students to keep this drawing as a blueprint for their e-Card circuit.

Create e-Card

See Jayla's Mystery Bash comic book 22-23

1 Brainstorm e-Card Ideas

- Show students an example of a working e-Card.
- Ask students to reference their color wheel collage and texture flip book.
- Ask students how they would incorporate collage and texture into their e-Card.

2 Design Front of e-Card (20-30 mins)

- Students are creating an invitation to Jayla's Mystery Bash, the invitation should represent mystery/surprise.
- Have students draw, use collage techniques, color theory, and texture to create their original design for their e-Card.

Note to facilitator: Remind students that this card will be shown to Jayla and they will be able to create an additional card for themselves or others after.

3 Produce e-Card (20 mins)

- Use the step-by-step e-Card production handout.

https://www.filepicker.io/api/file/4RX1PoJRuaIfx7JxXsLu

4 Share Out & Clean Up (5 mins)