Curriculum Documents

School: Ocean Township High School

Course: Maker Space I formerly Digital Media Design

Department: Technology

Supervisor: Patrick O'Neill

Board Approval	Supervisor	Notes
July 2016	Mike Lambusta	Update Standards and Name Change
December 2017	Patrick O'Neill	Update Standards

Week	Marking Period 1
1	Expectations & Elements of Maker Space I
2	Utilizing web-based tools and social media for creativity and presentation
3	3-D Design/Printing using Trimble Sketchup and Makerbot
4	Video Post Production – Adobe After Effects
5	
6	Intro to Robotics – Lego EV3 Kits
7	
8	Intro to Digital Storytelling, Podcasting and Multi-track Audio Production – Microsoft Photostory 3, Garageband
9	Intro to Digital Photography

Month	WEEK ONE
Topic 1	**Maker Space I Course Intro and Pre-Testing**

Big Idea

Orientation to the course content, requirements, safety, proficiency level and behavior expectations along with assessment of incoming student knowledge of digital media.

Essential Questions

- What is Makerspace and how has it evolved?
- What areas will be explored in the Makerspace course?
- What projects will be accomplished in the course?
- What are the student requirements in the Makerspace course?
- How is the course grade determined?
- What are the teacher expectations for student behavior in the Makerspace course?
- What general safety measures should I be aware of in the classroom environment?
- What safety measures should I be aware of when making photographs with electronic digital cameras and electrical lighting apparatus in the studio/ classroom?
- What electrical safety measures should I be aware of when using computer equipment and printers in the classroom?
- What safety measures should I be aware of when using the 3-D printer, robotics kits and other electrical equipment?
- What physical responses should I conduct in the event of personal injury, peer injury, or school evacuation requirements?

Enduring Understandings

- This course provides students with an understanding of the technological systems that extend the range of human communications, with an emphasis on visual communications processes. The course is an overview, which only begins to scrape the surface of the field of digital media. Students will complete this course knowing a little bit about a lot of things, but you will not master any one area. If any topics are of particular interest to a student, the instructor will offer further opportunities.
- Students completing the course will describe, demonstrate, compare, analyze, integrate, and critique Digital Media technologies related to: the principles of design; the fundamentals of graphic design and typography; the basic concepts of digital photography and scanning; the ethical ramifications of current communications systems; the evolution of digital technologies and implications for the future; 3-D design and prototyping; fundamentals of robotics; the basics of digital video post production; digital storytelling; multi-track audio.
- Makerspace Course Outline
- Student responsibilities
- Following safety rules prevents personal injury.
- Use of electricity requires safe measures and awareness.
- Hazardous conditions require personal attention and typically require evacuation.
- Equipment associated with Makerspace requires safe measures and awareness.

NJSLS	

Key Concepts and Skills

- Makerspace 1 Course Description
- Course Unit Outlines
- Course Requirements
- Proficiency Level
- Student Behavior Expectations
- Safety

Learning Activities

- Makerspace I Course Outline distribution and teacher presentation
- Teacher contact information
- Student use of school equipment including borrowing and explicit return policy
- Student behavior while using school computers, software, and peripheral equipment
- Extra Help Days
- Internet online website Edmodo.com acct. sign-up for virtual classroom, course testing and project critique use
- Q&A period for students
- PBS Series "Digital Nation" video segments
- Web-based presentation/creative tools: Voki, Prezi, Glogster, Xtranormal, Myna, etc.

Assessments

- Student/Parent Signature Acknowledgement Form for course outline & requirements.
- OTHS Makerspace Course Pre-Test (online; department purposes only)
- OTHS Applied Technology Safety Test

Month	WEEK TWO
Topic 2	**Web-based Tools for Creativity and Presentation, Social Media**

Big Idea

Students will be introduced to Web 2.0 tools in which content is created, shared, remixed, repurposed, and distributed. Learners will explore Blogs, Wikis, Social Networks, Social Bookmarks, Podcasts, RSS Feeds, Photo Sharing and other Web 2.0 tools to enhance their students' learning experiences. In addition, learners will incorporate 21st century skills as they relate to teaching and learning.

Essential Questions

- What is Web 2.0 and how did these technologies evolve?
- Identify uses for Web 2.0 in the classroom and industry

Enduring Understandings

- Identify how the use of "Web 2.0 tools" can deepen learning and increase audience engagement
- Identify how Web 2.0 tools support a student centered environment
- Assess and apply best practices in the use of Web 2.0 tools
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NJSLS	9.2.12

Key Concepts and Skills

- Participants will be able to demonstrate the ability to use and integrate various Web 2.0 tools.
- It is expected that participants share their course reflections in a blog and on the Edmodo classroom page.

Learning Activities

- Lecture presentation on key concepts
- Demonstration of various web-based tools and their possible applications
- Video tutorials
- Project design and presentation
- Setup and use a Blog (Google Blogger)
- Create social networking accounts via Vine, Twitter
- Use Audacity to create a podcast, and then post it
- Use SnapzPro or Camtasia to create a Screencast
- Create a YouTube account, post a video
- Use Google Docs for collaboration
- Create a mashup by adding a Youtube video and a Google map to a web page
- Identify uses for Web 2.0 outside the classroom, for recruiting and fund raising (Kickstarter)

Assessments

- Project-based rubrics, deadlines
- Blog, Edmodo entries
- Quiz
- Instructor anecdotal observation of student projects throughout the course

Month	WEEK THREE
Topic 3	**3-D Design and Printing via Sketchup and Makerbot Replicator 2**

Big Idea

Additive manufacturing or 3D printing is a process of making a three-dimensional solid object of virtually any shape from a digital model. 3D printing is achieved using an additive process, where successive layers of material are laid down in different shapes. 3D printing is considered distinct from traditional machining techniques, which mostly rely on the removal of material by methods such as cutting or drilling (subtractive processes).

Essential Questions

- How is 3-D artistic expression and visual communications linked?
- How is 3-D printing changing the culture of society?

Enduring Understandings

- 3-D design and printing is changing mass production to an additive process from a wasteful, subtractive one.
- While there are numerous beneficial applications for 3D printing, it also has some inherent ethical challenges that need to be addressed
- The digital revolution is forever changing industries and practices.

NJSLS	1.5, 5.2, 8.2

Key Concepts and Skills

- Explanation of 3-D design and printing software and hardware.
- 3-D design allowed two-dimensional artists to more accurately draw size and perspective.
- As a visual communications tool, 3-D can inform, educate, and persuade the viewer.
- Technological improvements brought 3-D design/printing to the masses of society, helping in the fields of science, maufacturing, art & medicine
- Electronics and computer technologies brought about the digital revolution in 3-D design

Learning Activities

- Lecture presentation on key concepts
- Video segments via TED.com, Youtube
- Demonstration of Trimble software, Google Earth and Makerbot hardware
- Hands-on 3-D design projects
- "Model Your Town" competition
- Exploratory research on future trends and inventions in the field of 3D Printing

Assessments

- Project-based rubrics, deadlines

- Blog, Edmodo entries
- Quiz
- Instructor anecdotal observation of student projects throughout the course

Month	WEEK FOUR & FIVE
Topic 4	Digital Video Post Production – Adobe After Effects

Big Idea

Adobe After Effects (part of CS4) is a digital motion graphics, visual effects and compositing software package published by Adobe Systems, used in the post-production process of filmmaking and television production. Its main uses are the origination of 2D and 2.5D animation, visual effects compositing and finishing (image adjustment, color correction etc.). After Effects can also be used as a basic non-linear editor and a media transcoder.

Essential Questions

- What is the importance of Digital Video Post Production in modern film making?
- What are the common components in post-production software and NLE (Non-Linear Editors)?

Enduring Understandings

- Animation and compositing via AE has become commonplace
- Animation requires keyframe interpolation
- The management of multiple layers is inherent in each AE project timeline
- AE workflow (PS, Premiere to AE, then compositing) is essential

NJSLS	4.1, 8.1, 8.2

Key Concepts and Skills

- AE Interface
- Adobe CS4 components and related software
- Keyframes
- Rendering
- Compositing (Pre-Comps, Mastering)
- Parenting

Learning Activities

- Lecture presentation on key concepts
- Video segments via TED.com, Youtube
- Demonstration of Adobe After Effects software
- Hands-on Video Post projects (in coordination with Mr. Pullano's Video classes)
- Student film festival

Assessments

- Project-based rubrics, deadlines
- Blog, Edmodo entries

- Quiz
- Instructor anecdotal observation of student projects throughout the course

Month	WEEK SIX & SEVEN
Topic 5	Intro to Robotics – Lego EV3

Big Idea

Robotics is the branch of technology that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing. These technologies deal with automated machines that can take the place of humans in dangerous environments or manufacturing processes, or resemble humans in appearance, behavior, and/or cognition.

Essential Questions

- What is a robot?
- How is the field of robotics changing modern life?
- How do the disciplines of mechanical engineering and computer science interact in the creation of a robot?
- How important is the Design Process when creating a robot for a specific task?

Enduring Understandings

- How to collaborate in groups and teams
- How to design robots for specific activities and scenarios
- How to use Robolab/Labview programming software
- How to use Lego EV3 hardware
- Gears, pulleys, torque, friction, timing, sensors, and program loops
- To design, develop and complete robotic activities and challenges

NJSLS	1.1, 1.2, 1.3, 1.4, 8.1

Key Concepts and Skills

- 9 step Design Process
- Brainstorming
- Collaborative Design
- Project-based Learning
- Criteria/Constraints
- Labview programming
- Lego EV3 kit materials

Learning Activities

- Lecture presentation on key concepts
- Video segments via TED.com, Youtube
- Demonstration of Lego EV3 hardware, Labview software
- Hands-on robotics projects
- Robotics competition (FIRST Lego League?)

Assessments
- Project-based rubrics, deadlines   - Blog, Edmodo entries   - Quiz   - Instructor anecdotal observation of student projects throughout the course

Month	WEEK EIGHT
Topic 6	**Digital Storytelling, Podcasting and Multitrack Audio**

Big Idea

Digital storytelling at its most basic core is the practice of using computer-based tools to tell stories. There are a wealth of other terms used to describe this practice, such as digital documentaries, computer-based narratives, digital essays, electronic memoirs, interactive storytelling, etc.; but in general, they all revolve around the idea of combining the art of telling stories with a variety of multimedia, including graphics, audio, video, and Web publishing.

Essential Questions

- What software/hardware is used for the production of digital stories, podcasts and multitrack audio?
- How does a script get conceptualized and written?
- Where can digital stories be showcased (distribution channels)?

Enduring Understandings

- Most digital stories focus on a specific topic and contain a particular point of view (POV)
- Digital stories usually contain some mixture of computer-based images, text, recorded audio narration, video clips, and/or music
- Digital stories can vary in length, but most of the stories typically last between 2 and 10 minutes
- Topics used in digital storytelling range from personal tales to the recounting of historical events, from exploring life in one's own community to the search for life in other corners of the universe, and literally, everything in between

NJSLS	1.2, 1.3, 1.4, 4.1, 4.2, 5.1, 5.7, 8.1, 8.2, 9.1, 9.2

Key Concepts and Skills

- Writing scripts
- Storyboards
- Managing media
- Understanding licensing and copyright
- Utilization of appropriate software and hardware to produce a product

Learning Activities

- Lecture presentation on key concepts
- Video segments via TED.com, Youtube, etc
- Demonstration of MS Photostory 3 software, Audacity, Garageband
- Hands-on projects

Assessments

- Project-based rubrics, deadlines
- Blog, Edmodo entries
- Quiz
- Instructor anecdotal observation of student projects throughout the course

Month	WEEK NINE
Topic 7	**Introduction to Digital Photography Unit**

Big Idea

Since the inception of photography, photographic images had been created with a chemical-based process. In the last two decades, Digital Photography has become ubiquitous.

Essential Questions

- What defines "digital" photography?
- How are images created, manipulated and distributed?

Enduring Understandings

- Students will know how to use various features of the camera to have creative control of photographs
- Students will understand basic studio lighting concepts and their applications
- Students will see how photographic composition can make or break a photograph
- Understand how to use photo editing software (Lightroom) to improve the overall appearance of images

NJSLS	5.1, 8.2, 9.2.12

Key Concepts and Skills

- Use of an incident light meter to measure flash output
- Use of Manual camera controls to determine exposure
- Basic understanding of photographic composition
- Use of standard studio lights and equipment to create desired effect
- Importing images into Adobe Lightroom for editing
- Publishing images via blogs and social media

Learning Activities

- Lecture presentation on key concepts
- Video segments via TED.com, Youtube, etc
- Demonstration of digital cameras, studio equipment, and Adobe Photoshop
- Hands-on projects

Assessments

- Project-based rubrics, deadlines
- Blog, Edmodo entries
- Quiz
- Instructor anecdotal observation of student projects throughout the course