

# SAN JOSE MUSEUM OF ART



## **SOWING CREATIVITY S.T.E.A.M. PROGRAM**

**2016-2017 CURRICULUM  
INVESTIGATING PERCEPTION**

**Teacher Packet**

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# SAN JOSE MUSEUM OF ART

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The San Jose Museum of Art celebrates new ideas, stimulates creativity, and inspires connection with every visit. Welcoming and thought-provoking, the Museum rejects stuffiness and delights visitors with its surprising and playful perspective on art and the artists of our time. The San Jose Museum of Art is the largest provider of arts education in Santa Clara County. The quality of its exhibitions, the extent of its educational programs, the expertise of its staff, and the depth of its ties in the local arts community uniquely qualify the museum to deliver the ambitious Sowing Creativity program.

**[www.sanjosemuseumofart.org](http://www.sanjosemuseumofart.org)**

*See what you think*

# CONTACT

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## Teachers,

This packet is intended to familiarize you with Sowing Creativity so you can make the most out of the program for you and your students. In addition to basic information, the packet includes a letter to parents that can be printed and distributed directly, or adapted to fit into your own parent newsletter. It also includes a detailed curriculum outline so you can plan ahead and connect the sessions to your classroom content. Lastly, it offers a number of resources for related activities before, during, and after the program.

**We look forward to working with you!**

Education Department, San Jose Museum of Art

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### To get your students ready:

Prior to the first Sowing Creativity session, students will benefit from the review of a few general guidelines:

- **Follow the instructions of the teaching artist carefully.**
- **Be respectful to others.**  
SJMA's Teaching Artists strive to create a safe learning environment where discussions promote the practice of respectful, democratic, and collaborative problem solving among students.
- **Be respectful of art materials.**  
SJMA Teaching Artists will be bringing in a variety of art materials. Although they are all AP certified non-toxic, some materials might stain clothes or other surfaces. We will make sure to bring in table coverings for particularly messy lessons.
- **Participate in all discussions and art making projects.**  
The Museum's approach to teaching draws on museum and education-based research, which shows that children learn best when they are encouraged to develop their own ideas, experience art through multiple senses, and actively participate in group settings.

### To get your classrooms ready:

Thank you for inviting us into your classroom! SJMA's Teaching Artists will make every effort to maintain a neat and orderly classroom environment while delivering the Sowing Creativity program. We are sensitive to and respectful of the patterns and practices you have already set up, so please do not hesitate to share your classroom management strategies. There are a few things that you and your students can do prior to each session that will help us deliver a more successful program:

- **Students should be seated at clear desks, ready to begin at start time of session.**
- **Space should be cleared for wet artwork to dry.**
- **Stored projects should be available when class begins.**

# SOWING CREATIVITY

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Sowing Creativity is an integrated visual arts residency program developed by the San Jose Museum of Art to address the new California Common Core State Standards and to meet the urgent need to promote creativity across disciplines. The premise behind the program is that well-honed visual thinking abilities contribute powerfully to the teaching and learning of specific cross-disciplinary concepts. Sowing Creativity brings elementary school classroom teachers together with teaching artists from SJMA and science instructors from the Youth Science Institute (YSI) to promote student creativity and success.

## 2016-2017 CURRICULUM: INVESTIGATING PERCEPTION

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**If you change the way you look at things, the things you look at change.**

The premise behind the Sowing Creativity curriculum is that well-honed visual thinking abilities can contribute powerfully to the teaching and learning of specific cross-disciplinary concepts. An investigation of *perception*, defined as “a thought, belief, or opinion, often held by many people based on experience,” encourages students to explore the both seen and unseen. A rich sequence of hands-on art making lessons and inquiry-based discussions of contemporary art help students to understand the shared art and science concepts of perception, perspective, optics, light, and color theory.

The integrated curriculum, developed collaboratively by SJMA’s teaching artists and YSI’s science instructors, leads students to ask and answer two essential questions: How can I look at the world different ways? What is the science behind looking and seeing?

## EDUCATIONAL FRAMEWORKS & STANDARDS

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Sowing Creativity is rooted in a number of educational frameworks. Following the national shift to **Common Core** standards, the program promotes an integrated approach to big-picture questions at the intersection of science and art. The curriculum aligns itself with the **California Visual Arts Standards** and the newly implemented **Next Generation Science Standards**. It is informed by the research-based initiative to add the arts into the nationally dominant science, technology, engineering, and math (STEM) curriculum. The shift from STEM to **STEAM** fosters true innovation founded in the belief that, by developing students’ abilities to use knowledge across contexts, the arts can play a vital role in promoting the four C’s of the **Partnership for 21st Century Learning** skills: creativity, critical thinking, collaboration, and communication. The program has also adopted the **Studio Habits of Mind** framework for teaching and learning in the visual arts as developed by the Harvard Graduate School of Education’s Project Zero.

# PROGRAM DELIVERABLES

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- **Pre-program meeting**

A required meeting with participating classroom teachers, the principal, and SJMA educators is held at each school before beginning the Sowing Creativity program. These meetings are a platform to collaborate, communicate, and work out any necessary logistics.

- **Eight hands-on artmaking sessions in the classroom**

SJMA teaching artists lead a weekly, hour-long artmaking session in each participating classroom. Over the course of eight weeks, students will complete up to four projects and participate in a range of processes that may include drawing, painting, printmaking, photography, and sculpture. All art materials, including a sketchbook/scientific journal for every student, are provided with the program.

- **A hands-on science lesson in the classroom**

In coordination with the teaching artist, a teaching scientist from the Youth Science Institute will lead an hour-long complementary science lesson in each participating classroom during the course of the 10-week program.

- **A field trip to the San Jose Museum of Art**

The Two-Part Art field trip to the museum encourages students to experience art as both viewers and makers. Each student participates in a one-hour, inquiry-based tour of selected artworks that relate to their classroom art and science lessons, followed or preceded by a corresponding one-hour hands-on art workshop.

- **Teachers' packet**

An informational packet is offered to all participating teachers in an effort to help develop classroom connections to the Sowing Creativity program. The teacher resource guides offer optional pre- and post-program activities as well as grade-appropriate suggestions for related books, videos, websites, and other local resources.

- **Teacher membership to museum**

Each participating classroom teacher and school principal receives a one-year Individual Membership to the San Jose Museum of Art. Benefits of the membership include free admission card for yourself and one guest, invitations to exhibition receptions and members-only events, discounted tickets for programs and lectures, SJMA e-News subscription and e-updates, and 10% discount in the SJMA Store and Café Too!

- **Post-program assessment**

In addition to formative and summative student assessments throughout the program, participating teachers will be directed to an online survey to provide feedback at the end of the Sowing Creativity. Each school also has the option to schedule a post-program meeting to discuss the successes of the program along with potential areas of improvement for the following year.



Parents,

Your child is participating as an artist and a scientist in Sowing Creativity, an integrated visual arts residency program piloted by the San Jose Museum of Art (SJMA). The program highlights the shared purposes, processes, and tools of art and science to promote creativity across disciplines. Sowing Creativity is providing your child's classroom with eight weekly hands-on art making with a SJMA teaching artist and a corresponding hands-on science lesson with a teaching scientist from the Youth Science Institute (YSI).

***Ask your child about what they are making!***

Also as part of the program, your child's class will be visiting the San Jose Museum of Art to experience art as a viewer, maker, and community member. The two-hour field trip consists of an inquiry-based gallery tour along with a related hands-on artmaking project. Chaperone admission is free with the visit and there is no limit on number of chaperones.

***Come visit the museum with your child!***

We are looking forward to working with your creative kids.

Sincerely,

Name of Artist , Teaching Artist  
and the SJMA Education Department

# SAN JOSE MUSEUM OF ART

Estimados padres,

Su hijo/a está participando como artista y científico en Sowing Creativity, un programa de arte visual integrado, dirigido por el San Jose Museum of Art (SJMA). El programa demuestra la unidad de propósitos, procesos y herramientas de arte y ciencia para fomentar la creatividad en todas las disciplinas. Sowing Creativity le está proporcionando a la clase de su niño/a ocho clases semanales de creación artística con un Artista Docente del SJMA y una lección científica con un científico de Youth Science Institute (YSI).

***Pregúntele a su niño acerca de lo que están haciendo!***

También como parte del programa, la clase de su hijo/a va a visitar el San Jose Museum of Art para experimentar el arte como un espectador, creador, y miembro de la comunidad. La excursión de dos horas consiste de una gira por la galería basado en la investigación junto con un proyecto de práctica en creación artística. Acompañar a su hijo/a al museo es gratuita, con la visita y no hay límite en el número de acompañantes.


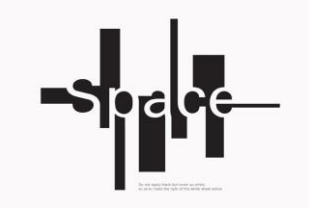
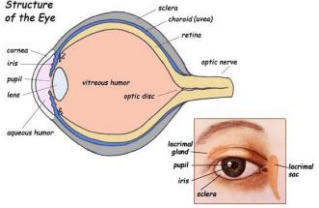
***Venga a visitar el museo con su hijola!***

Esperamos con gran interés trabajar con sus niños creativos.

Atentamente,

Name of Artist, Artista Docente

y el Departamento de Educación, San Jose Museum of Art

<p><b>PROJECT</b></p>	 <p><b>EYE-PAD JOURNALS</b></p>	 <p><b>MATTER OF FACT</b></p>	 <p><b>YSI: SCIENCE OF SIGHT</b></p>
<p><b>SESSION, TIME</b></p>	<p><b>Session 1, 1 hour</b></p>	<p><b>Session 2 &amp; 3, 2 hour</b></p>	<p><b>Session 4, 1 hour</b></p>
<p><b>PROBLEM/ACTIVITY STATEMENT</b></p>	<p>Each student receives a new “eye-pad” which serves as their sketchbook and scientific journal for exploration throughout the entire program. As an introductory activity, they learn about blind contour and gesture sketching from observation, then will touch, observe, sketch, and take notes about their environment.</p>	<p>Individually, students will brainstorm a list of different sentences comprised of random, interesting facts (or opinions) that they know. Students choose one sentence to use in their artwork. The layout of their text is planned with graphite pencil and finalized with crayon. Students will identify the positive and negative shapes.</p>	<p>In this classroom lesson, led by a science instructor from the Youth Science Institute, students participate small hands-on activities that encourage a deepening in their understanding of the optic and neurological science behind seeing. They build a simple model eye, view and discuss simple optical illusion, and create a light refractive spectroscope tool.</p>
<p><b>GOALS</b></p>	<p>Students will:  Make observations about objects and people in their environment. Understand how artists and scientists use journals as a tool. Create drawings from life.</p>	<p>Students will:  Identify positive and negative shapes. Use a variety of art tools. Learn about wax and water resist. Create an abstract artwork using text and color. Understand that the human eye occasionally has difficulty processing what it sees.</p>	<p>Students will:  Build a model demonstrating the construction of a human eye, learn that what they see may not always be the “truth,” understand how light is refracted.</p>
<p><b>CROSS-DISCIPLINARY CONNECTIONS</b></p>	<p>Scientific journaling, language arts, journaling</p>	<p>Penmanship, Drafting, Calligraphy, Social Science: Psychology</p>	<p>Biology, adaptation, light waves, color theory</p>
<p><b>PROCESSES</b></p>	<p>Sketching, journaling</p>	<p>Brainstorming, Collaborating, Sketching, Drawing, Painting</p>	<p>3-D model building</p>
<p><b>SKILLS</b></p>	<p>This lesson places an emphasis on observation and documentation as part of the creative process.</p>	<p>This lesson defines in simple terms positive and negative spaces in an artwork and prepares the students for future lessons. Students are also introduced to the styles of visual art known as optical art and abstract art.</p>	<p>Collaborative discussion, critical thinking, 3-d construction</p>
<p><b>CONCEPTS</b></p>	<p>Sketchbook, journaling, scientific illustration, gesture, blind contour, organic lines, and patterns.</p>	<p>Patterns; Scale, Proportion, &amp; Quantity</p>	<p>Pupil, iris, cornea, optic nerve, focus, light, refraction, optical illusion, spectroscope</p>
<p><b>STUDIO HABITS OF MIND</b></p>	<p>Develop Craft, Observe, Stretch and Explore</p>	<p>Develop Craft, Envision, Express, Reflect, Stretch &amp; Explore</p>	<p>Stretch and Explore, Observe, Reflect</p>
<p><b>NGSS SCIENCE &amp; ENGINEERING PRACTICES</b></p>	<p>Asking questions, Carrying out investigations, Obtaining, Evaluating, and Communicating Information</p>	<p>Analyzing and Interpreting Data; Obtaining, Evaluating, and Communicating Information</p>	<p>Asking questions, Carrying out investigations, Obtaining, evaluating, and communicating information</p>
<p><b>OPTIONAL CLASSROOM EXTENSIONS</b></p>	<p>Students should be encouraged to continue to use their journals throughout the day and across subjects.</p>	<p>Students may want to research calligraphy or make observations and record the behaviors of light and shadow in their daily life.</p>	<p>Using the spectroscopes in and out of class produced with different objects</p>



			
<b>SJMA FIELD TRIP</b>	<b>OUT OF THE BOX</b>	<b>DEPTH PERCEPTION</b>	<b>REFLECTIONS AND SHADOWS</b>
<b>Session 5, 2 hour</b>	Sessions 3 & 4, 2 hours	<b>Sessions 8 &amp; 9, 2 hours</b>	Session 10,1 hour
The Sowing Creativity Two-Part Art field trip includes a one-hour tour of the galleries with a member of the museum's gallery teaching staff. Students share their ideas about the artwork that they see in inquiry-based, open ended group discussions. The second hour consists of a hands-on artmaking activity in which students create their own simple animation device called a decotrope. .	Each student creates their own pinhole camera or camera obscura, a simple optical device that allows viewers to see the world upside down. They discuss a brief history of the camera obscura and learn the basic mechanics of how it works. After creating the devices, they experiment with looking at the world from a different perspective.	In this session student will be introduced with the concept of depth perception. We will explore how our eyes are able to see far into the distance and up close and why we are able to determine how far object are in perspective to ourselves. Student will be asked to create a scene using 3 layers. The background, the middle ground and the fore ground will create a depth painting.	In this lesson the students will observe and experiment with light and shadows using reflections from the sun. They will create color shadows and use the scientific method to discover and explore the negative and positive space created with the reflections.
Students will: Experience art as makers, viewers, and active community members, engage with contemporary art through close looking, critical thinking, and collaborative discussion	Students will: Learn that light travels in a straight path; Understand the basics of photographic optics. Transform an observational drawing into an imaginary illustration.	Students will: Learn how artists use layers to create depth in a work of art; Learn artistic terms such as foreground and background as they create their own layering effects; Will be able to describe their painting using artistic terms.	Students will: Explore light shadows , Students will learn about reflection and color shadows, Students will apply the scientific method to their art exploration
Variable based on current exhibitions and art work visited	Technology, optics, photography, historical inventions, light	Depth perception	Reflections, shadows, light, vision and optics, perception
Optical illusions, Sequential storytelling, Technology, Illustration, and Animation	3-dimensional construction	Sketching, drawing, paint markers, transparency sheets	Transformation of everyday objects such as mirrors using simple pigmentation
Looking closely, critical thinking, collaborative discussion	Sequential 3-d construction, fine motor skills, investigation	Layering paintings, deconstructing, looking closely, 3-d construction	Collaborative discussion, critical thinking, using the scientific method
Museum, gallery, translucent, perspective, illusion, reflection and other terms based on current exhibitions and art work visited	Camera obscura, aperture, lens, perception	Depth, visual perception, distance, layers, foreground, middle ground and background	Reflection, color shadows, negative and positive space, color, light bending, translucent opaque
Understand Arts Community, Express, Reflect	- Develop Craft - Engage and persist - Reflect	Stretch and explore, express, envision, understanding arts and community, reflect	Stretch and explore, express, envision, understanding arts and community, reflect
Asking questions, Carrying out investigations, Engaging in arguments from evidence	- Carrying out investigations - Asking questions - Constructing explanations	Asking questions, Carrying out investigations, Obtaining, evaluating, and communicating information	Asking questions, Carrying out investigations, Constructing explanations, scientific method
Art Walk at your school or go online to sjmusart.org and browse the permanent collection	Take students on a walk with their camera obscuras. Have them reflectively write about their observations upon returning.	View old Animation techniques .	Use mirrors to create reflections and shadows, video a performance of students describing the experience and what they created.

# Classroom Resources

## Investigating Perception

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### Books:

#### **Prentice Hall Science Explorer Sound and Light**

By PRENTICE HALL

This hands-on content-rich program enables you to lead your students through explorations of specific concepts within Life, Earth, and Physical Science.

#### **Xtreme Illusions (National Geographic Kids)**

by National Geographic

Seeing is believing. But what if you simply can't believe your eyes? Dive into another dimension and experience the eye-boggling and brain-twisting extremes of these awesome optical illusions. This mind-bending collection of visual puzzles will amaze your friends, mystify your family and even blow your own mind! Extreme Illusions features every kind of visual trick and deceptive image, all in a cutting-edge style and using dynamic paper mechanics that are instantly engaging.

#### **Bending Light: The Fine Art of Flower Abstraction Kindle Edition**

by Mark Lissick

Bending Light is a fine art image book created by award winning nature photographer Mark Lissick. It contains 59 unique and innovative images that blur the boundary between photography and art while taking you on a visual journey of creativity. Using flowers as the source of color, shape, and tone, they become the paintbrushes to produce sweeping color and line on a digital canvas.

#### **Magic Eye: A New Way of Looking at the World**

by N.E.Thing Enterprises

Family and friends will enjoy hours of entertainment while viewing the amazing 3D illustrations found in the #1 *New York Times Bestseller*, Magic Eye: A New Way of Looking at the World. Embedded within each image is an enchanting 3D object or scene that materializes before the viewer's eyes. Simple viewing instructions and a solution key are included.

#### **Eye: How It Works**

by David Macaulay & Sheila Keenan

How can you see that your shirt is on inside out? How do you see the soccer ball coming right at you? How do you know which players are on your team? It all starts with light--and with the amazing human eye. With his unique blend of informative text and illustration, David Macaulay shows how this extraordinary organ works to capture light and send signals to our brains.

#### **Shadows and Reflections**

by Tana Hoban

Shadows and reflections are all around us -- under our feet, over our heads, directly in front of us. But only Tana Hoban can make us look at -- and see -- what is right before our eyes. She makes us look with our minds and hearts and imaginations -- and our surroundings are forever changed

#### **How to Be an Explorer of the World: Portable Life Museum**

By Keri Smith

Artists and scientists analyze the world around them in surprisingly similar ways, by observing, collecting, documenting, analyzing, and comparing. In this captivating guided journal, readers are encouraged to explore their world as both artists and scientists

## Websites:

### Brain Games: National Geographic

<http://channel.nationalgeographic.com/brain-games/videos/brain-games-seeing-is-believing-preview/>

This Emmy-nominated series is designed to mess with the ultimate supercomputer. Host Jason Silva reveals how brains process information. Interactive games and hidden-camera experiments capture hilarious and shocking results, and viewers get real-world takeaways.

### NHI- Kid's Page: Illusion Games

[http://kids.niehs.nih.gov/games/illusions/lots\\_of\\_illusions.htm](http://kids.niehs.nih.gov/games/illusions/lots_of_illusions.htm)

What are Illusions? Illusions trick us into perceiving something differently than it actually exists, so what we see does not correspond to physical reality. Hence, the word illusion comes from the Latin word *verbilludere* meaning "to mock." In addition, some illusions show us one thing in a picture, while someone else sees something entirely different in the same picture.

### Kids Health: Your Eyes

<http://kidshealth.org/kid/htbw/eyes.html>

Which part of your body lets you read the back of a cereal box, check out a rainbow, and see a softball heading your way? Which part lets you cry when you're sad and makes tears to protect itself? Which part has muscles that adjust to let you focus on things that are close up or far away? If you guessed the eye, you're right!

### Ducksters: Science of Light

<http://www.ducksters.com/science/light.php>

Help students understand how light is made and answer questions like Why does light go through some things and not others? How Light helps us to survive, what is the speed of light? And what is Refraction?

## Videos:

### Kids Health: How Your Eyes Work

<https://www.youtube.com/watch?v=syaQgmxb5i0>

Your eyes see, but how does vision happen? Find out how the eyes and brain work together in this eye video.

### Amazing Sidewalk illusions Chalk 3D Street Art

<https://www.youtube.com/watch?v=kagKgpbDbJco&feature=youtu.be>

Painted bridge optical illusion, amazing sidewalk illusion, coffee on the street illusion, crazy cliff sidewalk optical illusion, escalator sidewalk illusion, flying carpet, gone fishing, hole in the ground sidewalk illusion, ice fishing sidewalk optical illusion, sidewalk frog optical illusion, sidewalk river optical illusion, swimming pool sidewalk optical illusion, falling down stairs sidewalk illusion.

### Reflection and Refraction of light - Introduction for kids

<https://www.youtube.com/watch?v=JRh0CGfX7dQ>

The best and the biggest channel for science videos for kids. Light can bounce off when it hits objects and it can bend also while passing through from one medium to another.

### Nat Geo Kids Learn About Sound

[https://www.youtube.com/watch?v=HblEhc0gses&list=PLQlnTldJs0ZQRzLgW42JXOV\\_KjtG7TXck](https://www.youtube.com/watch?v=HblEhc0gses&list=PLQlnTldJs0ZQRzLgW42JXOV_KjtG7TXck)

Discover the very best videos about sound YouTube has to offer - brought to you by National Geographic Kids!

# SOWING CREATIVITY 2016

## Science Connections

There are many exciting ways to link Sowing Creativity with the NGSS (Next Generation Science Standards). NGSS items that align well with each Sowing Creativity activity are highlighted below:

**1** = Strong alignment

**2** = Possible alignment

SEP: SCIENCE AND ENGINEERING PRACTICES	Eye Pad	Matter of Fact	YSI Visit	Field Trip	Pin Cam.	Depth Per.	Reflect
Ask questions and define problems	1		2	1	1	1	1
Use drawings and models	2	1	1	1	1	2	2
Plan and carry out investigations	2	2	1	1	2	1	1
Analyze data from trials	2		2	1	1		
Use math and computational thinking	1						
Construct explanations/design solutions	2	1	2	2		1	1
Argue from evidence	2		1	1		1	
Obtain, evaluate, and communicate info.	1	1	2	1	2	2	1
<b>DCI: DISCIPLINARY CORE IDEAS</b>							
Develop possible solutions (ETS1)	1	1	1	1	1	1	1
<b>CCC: CROSS-CUTTING CONCEPTS</b>							
Patterns	1	1	2	1	2	1	1
Cause and effect	1	1	1	1	1	1	2
Scale, proportion and quantity	1	1		1	2	1	2
Systems and system models			2		1		1
Energy and matter			1		1		1
Structure and function		2	1	2	2	1	1
Stability and change	1	2		2			1

## APPENDIX 1: Nature of Science

The NGSS focus on helping children understand “the nature of science.” This focus is clearly documented in Appendix H:

- Scientists use tools and technologies to make accurate measurements and observations.
- Scientists use drawings, sketches, and models as a way to communicate ideas.
- Science theories are based on a body of evidence and many tests.

The Sowing Creativity projects provide students with a simple and effective medium to:

- Document questions
- Share interests and ideas
- Express feelings
- Collect drawings, designs and sketches
- Plan projects
- Make measurements
- Record observations
- Communicate insights

As students become more expressive and perceptive artists, they also become more creative and observant scientists.

## APPENDIX 2: 21<sup>st</sup> CENTURY SKILLS

The “4C’s” are not part of the NGSS, but are closely related to the practices, DCI’s, and cross-cutting concepts.

The strongest 4C alignments to Sowing Creativity are shown below:

4C's: 21 <sup>st</sup> CENTURY SKILLS	Eye Pad	Matter of Fact	YSI Visit	Field Trip	Pin Cam.	Depth Per.	Reflect
Creativity	1	1	1	1	1	1	1
Critical Thinking	1	2	1	1	1	1	1
Collaboration	2	1	1	1	2		1
Communication	1	1	1	1	2	1	1

