

verizon

PLTW

Emoji

Learner Guide




Have you ever wondered where new emojis come from? In this activity, you will work like a graphic designer to use your creativity and critical thinking skills to create your own emoji.



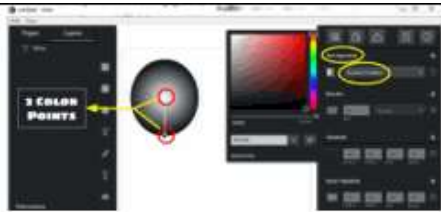
You will use polygons and other shapes to create two-dimensional (2D) illustrations called vector graphics. Vector graphic illustrations can create a wide variety of images and emojis.

Watch the Emoji Design video to find out more about how a graphic designer uses vector graphics.

Explore

1. Open Vectr graphic design tools found at <https://vectr.com/>. Practice using each one. The below Vectr Reference Chart describes their functions.

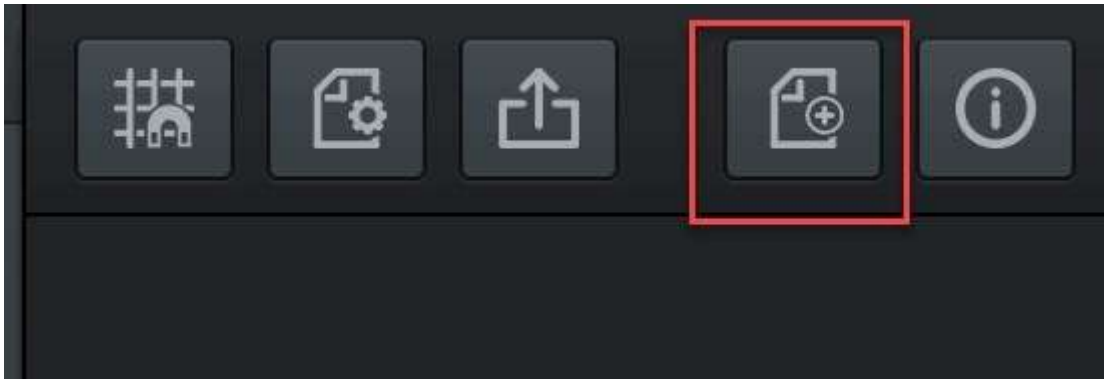
Vectr Tool	Function	Visual
Ellipse Tool	The ellipse tool will allow you to create a spherical shape design.	
Rectangle Tool	The rectangle tool will allow you to create a rectangular shape design.	
Pen Tool	The pen tool will allow you to create your own shape by connecting line segments in a design of your choosing.	

Vectr Tool	Function	Visual
More Shapes Tool	The more shapes tool will allow you to choose different shapes already created.	
Linear Gradient Background Tool	A background fill that blends two or more colors along a straight line.	
Radial Gradient Background Fill	A background fill that blends two or more colors from the center toward the outside of the shape creating a circular blending effect.	

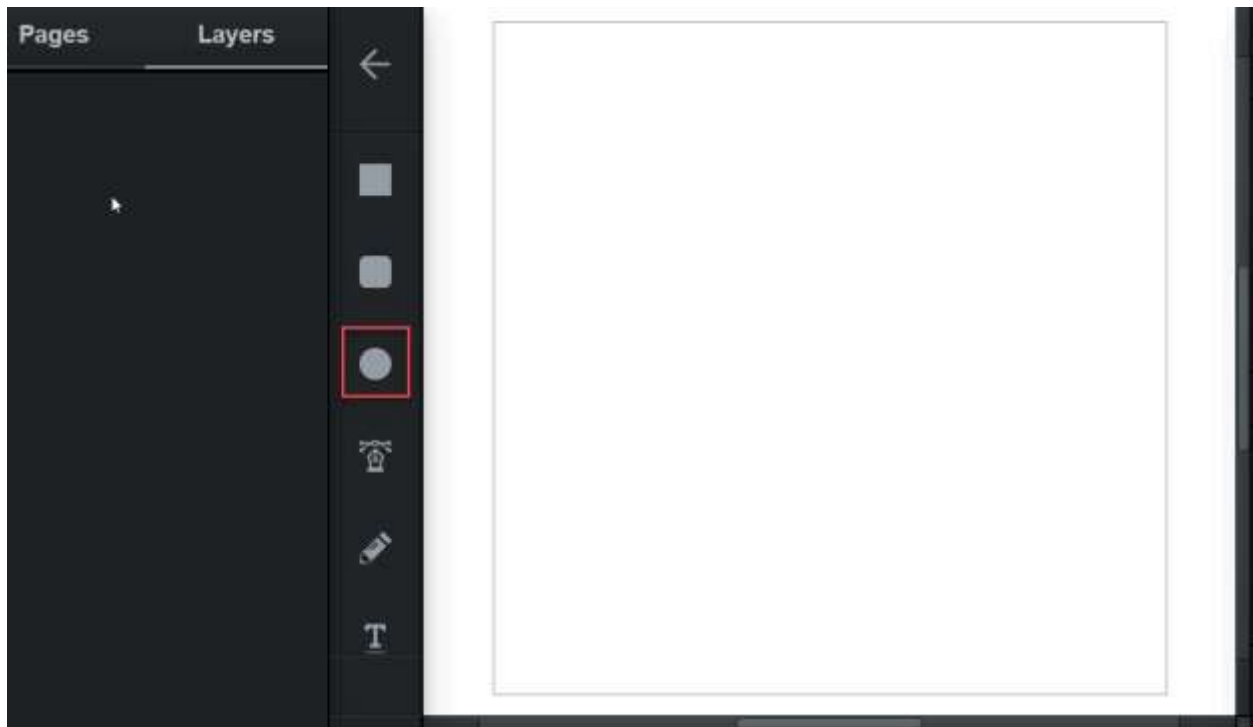
- After you have successfully tried each tool on the Vectr Reference Chart, think about the type of emoji you want to create with Vectr. To inspire you, notice how the placement of the eyes, eyebrows, and mouth on some of these popular emojis help convey a feeling or emotion.



3. In Vectr, select New File at the top right of the program window.



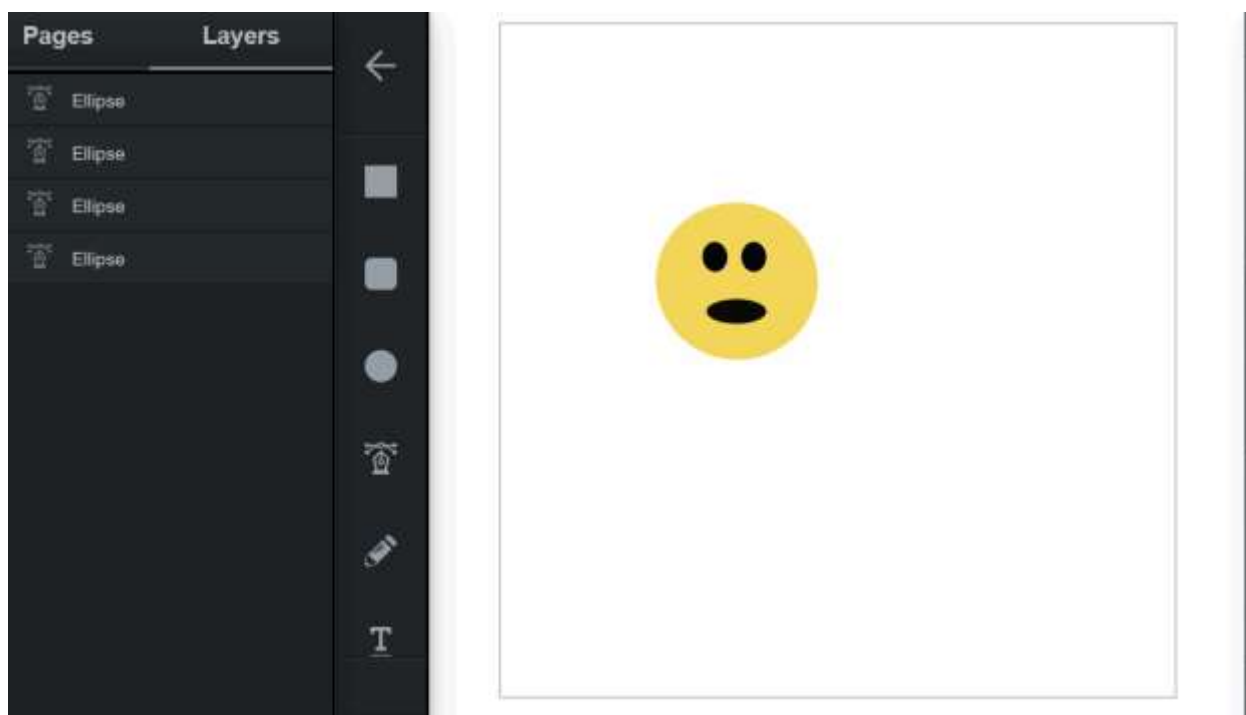
4. Select ellipse in the left tool column then draw an ellipse in the blank workspace. Your ellipse will appear in the workspace.



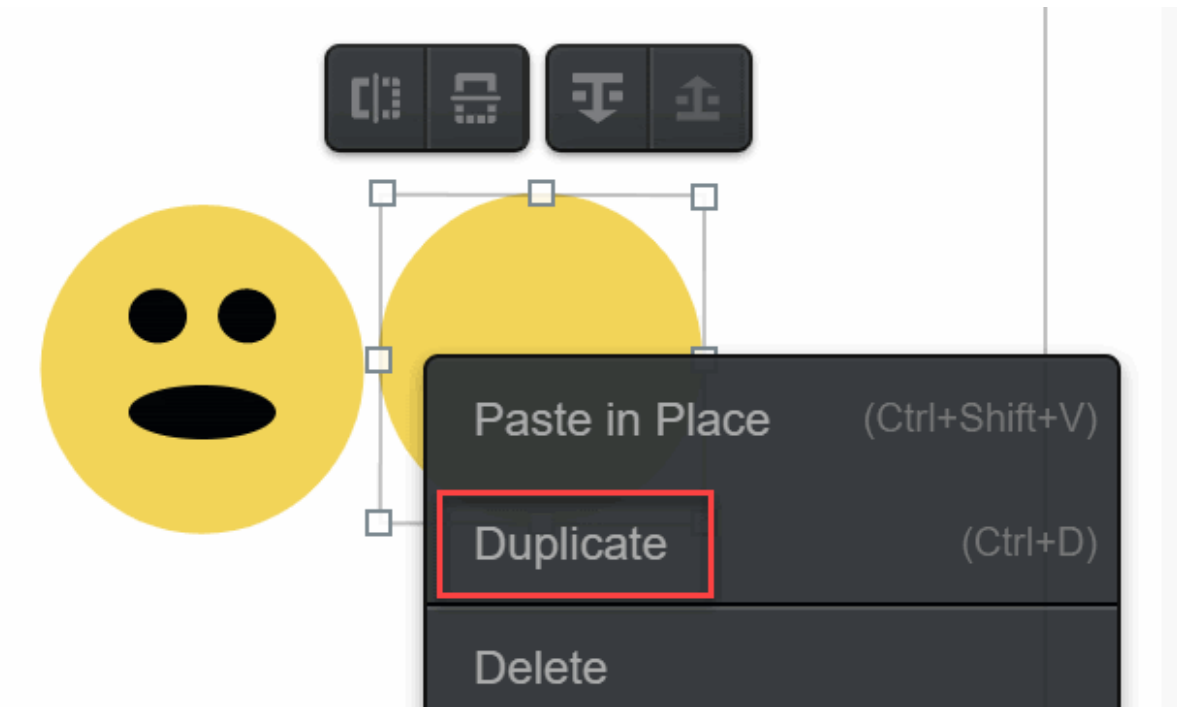
5. Add color to the ellipse using Vectr's Colorpicker. Select "color" in "Background" to open. Use the hue slider, on the right side of the Colorpicker, to select your base color choice, then use the color panel on the left for the tone of the hue selected.



6. Use the drawing tools to create features on your emoji.



7. Make several models of your ideas. Right click on the larger ellipse and select duplicate to create a copy of the shape. Change a few of the features to get different looks. Try to be unique!



8. Which emoji is your favorite?

Use this decision matrix to help you decide which emoji you like the best.

Question	Model 1	Model 2	Model 3
Do the facial features on my emoji match the emotion I want to portray?			
Do the colors used in my emoji portray the emotion?			
Can I explain to another person how the emoji design portrays the chosen emotion?			

Create

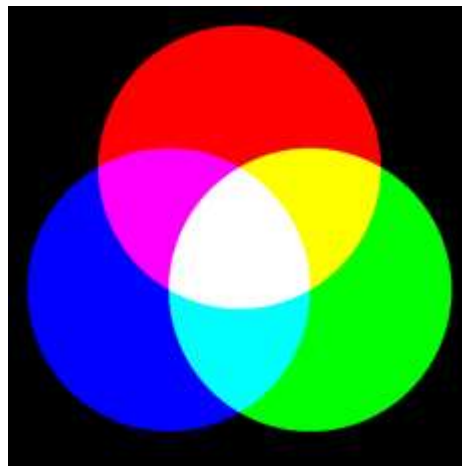
Make It Your Own

Now that you have an emoji, make it your own by modifying some of its colors. To do that, it will help to understand a bit more about how computers represent color.

Digital artists use RGB colors. RGB stands for red, green, blue. All the colors of light that you see on a computer screen are combinations of different amounts of red, green, and blue light. The thing that makes each color unique is the intensity, or the amount of red, green, and blue light that is in its mix.




A Perfect Match

Next you will use color to make changes to your emoji to make it look like you. A range of colors can be created by combining different colors. Notice in the chart how mixing red, green and blue light produces other colors.



Using different intensities of color is what makes different shades of color. Numbers that range from 0 to 255 describe the different intensities of red, green, or blue for each color. Zero means that there is none of that color present and 255 means that the color is present at its highest intensity.

Colors always have the same value order: red, green, blue.


Color	RGB Value	Description
	235, 51, 0	This series represents a color that is mostly red
	0, 177, 60	This series represents a color that is mostly green
	0, 61, 165	This series represents a color that is mostly blue

The color editor on Vectr can make it tricky to find the tone that matches your shade of skin. When looking for a specific color, graphic designers turn to the Pantone Guide. This is the industry standard for describing a color.

9. Use the Pantone Guide, available at <https://www.pantone.com/color-finder> to find the color that matches your skin.
10. A large color sample will appear. To the right of it you will see its RGB series.

Find another color

PANTONE 154 C



Color values:

RGB	155 90 26
HEX/HTML	9B5A1A
CMYK	0 57 100 38

Please note that RGB & Hex/HTML values will differ between the PANTONE Color Finder and the PANTONE Color Bridge Guides due to different standards for print and digital use. For the PANTONE Color Bridge Guides we use the M1 lighting standard to align with industry standards for process printing. For the PANTONE Color Finder we use the M2 lighting standard to align with commonly used design software like Adobe Photoshop.

INTRODUCING

A timeless and enduring blue hue elegant in its simplicity.

LEARN MORE

Color of the Year 2020

PANTONE

Classic Blue 19-4052

11. To the right of the color sample is the RGB series of the color intensities for your skin tone.

Write the numbers in the RGB series that matches your skin tone.

12. Go back to your Vectr page and select the ellipse you used to create the main part of your emoji.
13. In order to insert the rgb series you want, you need to enter its red value, green value, blue value, and alpha value manually into Colorpicker's dropdown menu. Alpha means opacity and its value can either be a 0, for completely transparent, or a 1 for opaque. Use an opaque value of 1 for your emoji. For example, if your skin tone's RGB series is 196, 162, 138, then you would enter "rgba(196,162,138,1)."



Vectr will automatically convert your rgba number into what is known as a hexadecimal number, or hex for short.

Extension Challenge: The Story of Bits and Bytes

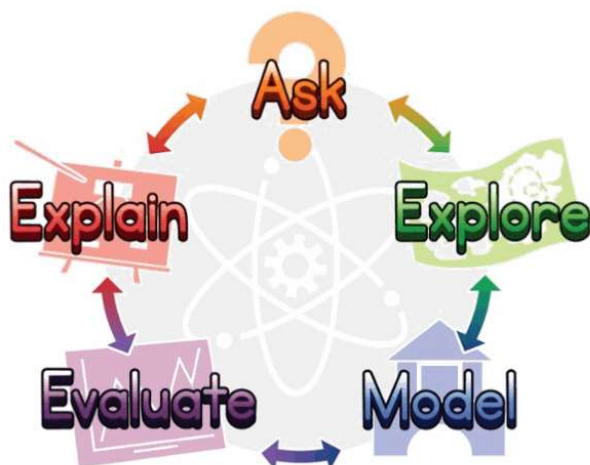
Hexadecimal numbers start with a pound sign (or hashtag) and are followed by six letters or numbers. The first two digits refer to red, the next two to green and the last two are blue. Hexadecimal numbers use the base 16 number system. Learn more about this in the extension activity The Story of Bits and Bytes.



14. Try changing other features on your emoji, such as the eyes, smile, hair, glasses, etc. to look like you.
15. Evaluate your emoji using the decision matrix chart.




Question	Yes
Does it have features similar to you?	
Does it portray an emotion?	
Can you explain to another person how the emoji design portrays the chosen emotion?	

Real World Connection

The Design Process using this flow of ideas:



	<p>A graphic designer would use this step to first ask a question.</p> <p>1. What was the question you had to address for this activity?</p>
	<p>A graphic designer would explore creating designs with different tools.</p> <p>2. What graphic design program did you explore?</p>

	<p>Making models of design ideas is a large part of a graphic designer's work.</p> <p>3. What did you learn from making each model?</p>
	<p>A graphic designer evaluates whether the models that she/he created follow the requests the client made. A graphic designer might also speak with colleagues to get input on a design to make sure it conveys the correct information.</p> <p>4. What helped you to decide which of your emojis was the best model?</p>
	<p>When a graphic designer shares their best model with the person who requested the design, this gives them a chance to explain how they created the model.</p> <p>5. How did you share and explain your emoji?</p>

Your Next Move

1. List three things that your emoji could be used for:
2. What could you do to get other people to start using your emoji?

Extension: The Story of Bits and Bytes

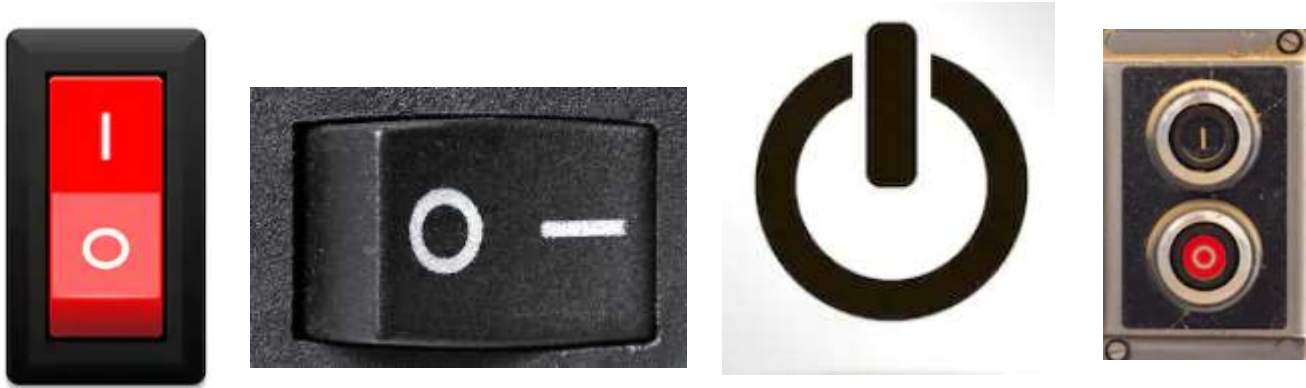
Have you ever wondered how an electronic device stores data? Or how a picture can be saved on a phone or music be played on a mobile device? How are images, sound, video, and other forms of data translated into the digital world? This is all done by translating electricity to 1's and 0's.

On Again, Off Again

Electronic devices use tiny electronic components called transistors to store data. These transistors can hold electric signals and can be one of two states: ON or OFF. If the signal is ON, the value of that transistor is 1; if it is OFF, its value is 0. Computers store and process data all through 1's and 0's in a system called the binary number system.

Why do you think this system is called binary?

1. Look at these on off switches. Do you see how they display zeros and ones?



2. Name some devices which have 1s and 0s on their on off switch.

Seeing Double

Because this system has only two possible values, 1 or 0, it is called the binary number system. This system is different than the number system we use every day, called the decimal number system, which utilizes 10 digits to represent all numbers (0-9).

But how can a computer store so much information using just 1s and 0s?

We call every value of 1 or 0 a bit, which is short for binary digit. One bit can only store two possible values, a 1 or a 0. Bits can only store one of two values, a 1 or a 0.

	1 bit	Resulting Binary Numbers
Possible Bit Combinations	0	0
	1	1

Figure 1. Data in a Bit

If you put two bits together, then you should get $2 \times 2 = 4$ (or 2^2) possible combinations, as shown below:

	2 bits		Resulting Binary Numbers
Possible Bit Combinations	0	0	00
		1	01
	1	0	10
		1	11

Figure 2. Data in Two Bits

Can you guess how many values you can store with 3 bits? $2 \times 2 \times 2$?

3. Complete the chart.

	3 bits			Resulting Binary Numbers
Possible Bit Combinations	0	0	0	
			1	
		1	0	
			1	
	1	0	0	
			1	
		1	0	
			1	

Computers use a combination of bits allowing for more values to be stored.

Even though the bit is the smallest unit of data storage, the most common unit of storage in modern computers is a collection of 8 bits, called a byte. These 8 bits can store $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ combinations of data, which computes to 256 values.

4. A byte has 256 values in it. How does this number relate to the Pantone Guide?

Hint: values begin counting with zero, not one, so there would be 256 values if you counted from 0 to 255.

Hexa-what?

Computer system designers and programmers would have a difficult time if they had to use the series of 1's and 0's of binary code, also called machine language, to work with computers. Instead, they use the hexadecimal numbers that provide a more human-friendly representation of binary-coded values. In the hexadecimal number system, each hexadecimal digit represents four binary digits. Let's compare the hexadecimal number system to the decimal number system. The hexadecimal system uses a base 16 number system. Hexadecimal uses decimal numbers 1 through 9 and then uses letters A through F. Here is how it compares to decimal.

Hexa decimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Since 8 goes into 16 evenly, hexadecimals could serve as a shortcut for writing in binary. Here is a comparison of 32 decimal written in several forms.

Decimal	Binary	Hexadecimal
32	100000	20

You can see how it would be much easier to use hex as a shortcut. This is especially true when you get to more complicated processes, such as writing code for computers.

Extension: Decode Unicode

Pop Ups

Have you ever received a message with an emoji that you would really like to use, but you do not see it on your emoji menu? Try using the emoji's shortcode. Shortcodes are codes used to aid emoji insertion using a keyboard. For example, if while sending a message you type :smile: on a messaging app, a 😊 will automatically appear, if that app uses shortcodes.

Computers store letters and symbols and other characters by assigning a unique number to each. When computers first became widely used, these numbers were assigned using many different systems. This became too confusing because many times the systems used completely different numbers to mean the same thing. To make it all easier to understand, the industry adopted a single standard called Unicode.

Good Character

Each platform has its own preference for the characters used in the shortcode format. A common character choice is a **colon** placed before and after the word.

Across several different platforms, “:grin:” is the shortcode for a smiley face.

Browser	Appl	Goog	FB	Wind	Twtr	Joy	Sams	GMail	SB	DCM	KDDI	CLDR Short Name
									—	—	—	grinning face

1. Apple and Google are two of the platforms that recognize the grin shortcode. What other platforms do you see that use the grin emoji?
2. Get on a messaging platform and try typing in different words that you think might be a shortcode. Which shortcodes did you find?