

Forensics Fun

Science Activity



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2 Activities exploring forensics, fingerprints, and thermal energy

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- Claire & Natasha, The Vivify Team

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Overview

This product includes 2 activities related to forensics including revealing a student's heat signature and unique fingerprint.

Activity 1: A worksheet that guides two students to compare their unique fingerprints with a real-world connection to forensics. A QR code reveals a STEM career video on forensic science and crime scenes.

Worksheet in both English and Spanish

Activity 2: This activity requires a thermal camera for students to explore the infrared world! We recommend the [SEEK camera](#) that attaches to an Android tablet or iPad. The activity is perfect for a STEM Family Night or small group station.



Forensics Fun

Fingerprints are the tiny patterns on the tip of each finger. They form from pressure on a baby's tiny, developing fingers in the womb. No two people have been found to have the same fingerprints.

Time to discover your fingerprints! Complete this activity with a partner to compare.

1. Draw pencil led or graphite on a piece of paper. Press your left thumb in graphite until coated. With a helper, place a piece of tape on your finger to get a copy of your fingerprint.
2. Remove tape from finger. Place tape in first box in table below. Determine type of fingerprint: arch, loop, or whorl. Have your partner do the same and compare.



Loop



Whorl



Arch



Participant 1: _____

	Copy of Fingerprint	Type
Left Thumb		
Left Index Finger		

Participant 2: _____

	Copy of Fingerprint	Type
Left Thumb		
Left Index Finger		

Fingerprinting is one form of **biometrics**, a science that uses people's physical characteristics to identify them. Police can analyze fingerprints they find at the scene of a crime. **Visible prints** are made on a type of surface that creates an impression, like blood, dirt or clay. **Latent prints** are made when sweat, oil or other substances on the skin reproduce the ridge structure of the fingerprints on a surface such as glass. These prints can't be seen with the naked eye, but they can be made visible using dark powder, lasers or other light sources.

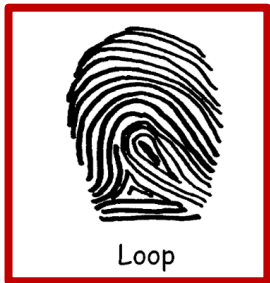


Diversión Forense

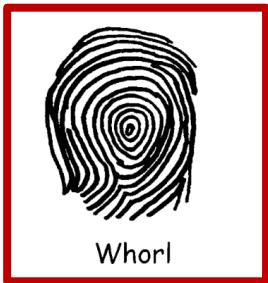
Las huellas digitales son los pequeños patrones en la punta de cada dedo. Se forman a partir de la presión sobre los pequeños dedos en desarrollo del bebé en el útero. No se ha encontrado que dos personas tengan las mismas huellas dactilares.

¡Ahora a descubrir tus huellas dactilares! Complete esta actividad con un compañero para comparar.

1. Dibuja con un lápiz sacando grafito en una hoja de papel. Presione la yema del dedo en grafito hasta que esté cubierto. Con un ayudante, coloque una cinta adhesiva en su dedo para obtener una copia de su huella digital.
2. Retire la cinta del dedo y colóquela en el primer óvalo en la hoja del laboratorio. Determine el tipo de huella digital: "arch", "loop", o "whorl". Haga que su compañero haga lo mismo y compare.



Loop



Whorl



Arch



Participant 1: _____

	Copia de huella digital	Tipo
Pulgar izquierdo		
Dedo índice izquierdo		

Participant 2: _____

	Copia de huella digital	Tipo
Pulgar izquierdo		
Dedo índice izquierdo		

La huella digital es una forma de biometría, una ciencia que utiliza las características físicas de las personas para identificarlas. La policía puede analizar las huellas dactilares que se encuentran en la escena de un crimen. Las impresiones visibles se realizan sobre un tipo de superficie que crea una impresión, como sangre, suciedad o arcilla. Las impresiones latentes se realizan cuando el sudor, el aceite u otras sustancias en la piel reproducen la estructura de la cresta de las huellas digitales en una superficie como el vidrio. Estas impresiones no se pueden ver a simple vista, pero pueden hacerse visibles usando polvo oscuro, láser u otras fuentes de luz.

Forensics Fun

Reveal your unique heat signature and fingerprints.

Materials

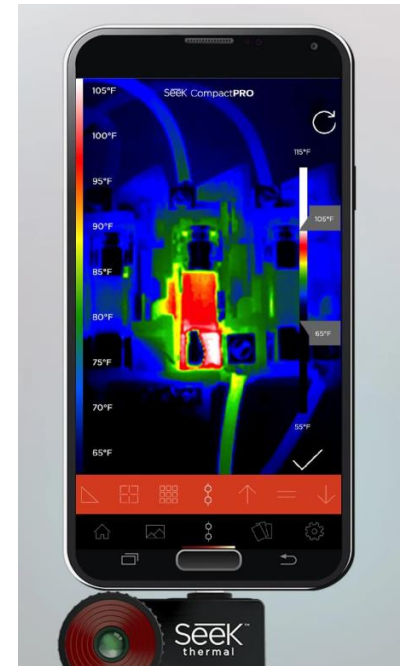
Thermal Camera Activity

- iPads
- Seek Thermal Camera



Fingerprinting Activity

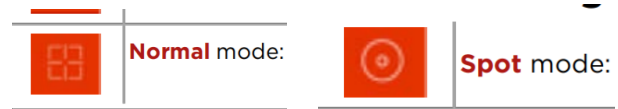
- Graphite Stick
- Paper
- Forensics Fun Worksheet
- Clear Tape
- Wipes



Station Set-up

- This station has two different activities:
 - Thermal Camera:** Students will explore the infrared world with a thermal camera attached to a tablet. This is an exploratory activity. Instructions are below.
 - Fingering Worksheet:** Student follow the instructions on the worksheet to discover their type of fingerprint and compare with a partner. Instructions for this activity are on the student worksheet (available in English and Spanish).
- Depending on number of volunteers and participants, you may wish to have students complete both or select one. If completing both, have students work on the fingerprinting worksheet while waiting to use the thermal camera.

Thermal Camera - Station Set-up



- Insert SEEK Thermal camera into iPad and open Seek app.
- Allow students to explore the infrared world! The SEEK thermal camera detects infrared energy, or heat, of surrounding objects. The different colors represent different temperatures and the scale shows what each color represents. Enter Normal mode to view range of temperatures. Enter Spot mode to pinpoint a specific temperature.
- Heat Transfer:** Point camera towards a wall or table. Ask someone to place their hand on the surface for 5 seconds. Remove hand. A hand print is still visible on the surface! Why? Some heat was transferred from the hand to the surface.
- Friction:** Point camera towards someone's hands. Ask them to rub hands together. What happened? Friction is a force that resists the relative motion of two surfaces sliding against each other. Kinetic energy converts into thermal energy, which is shown by an increase in temperature on objects involved. The rubbing also causes the increase in vibration of the molecules involved due to their relative motions.