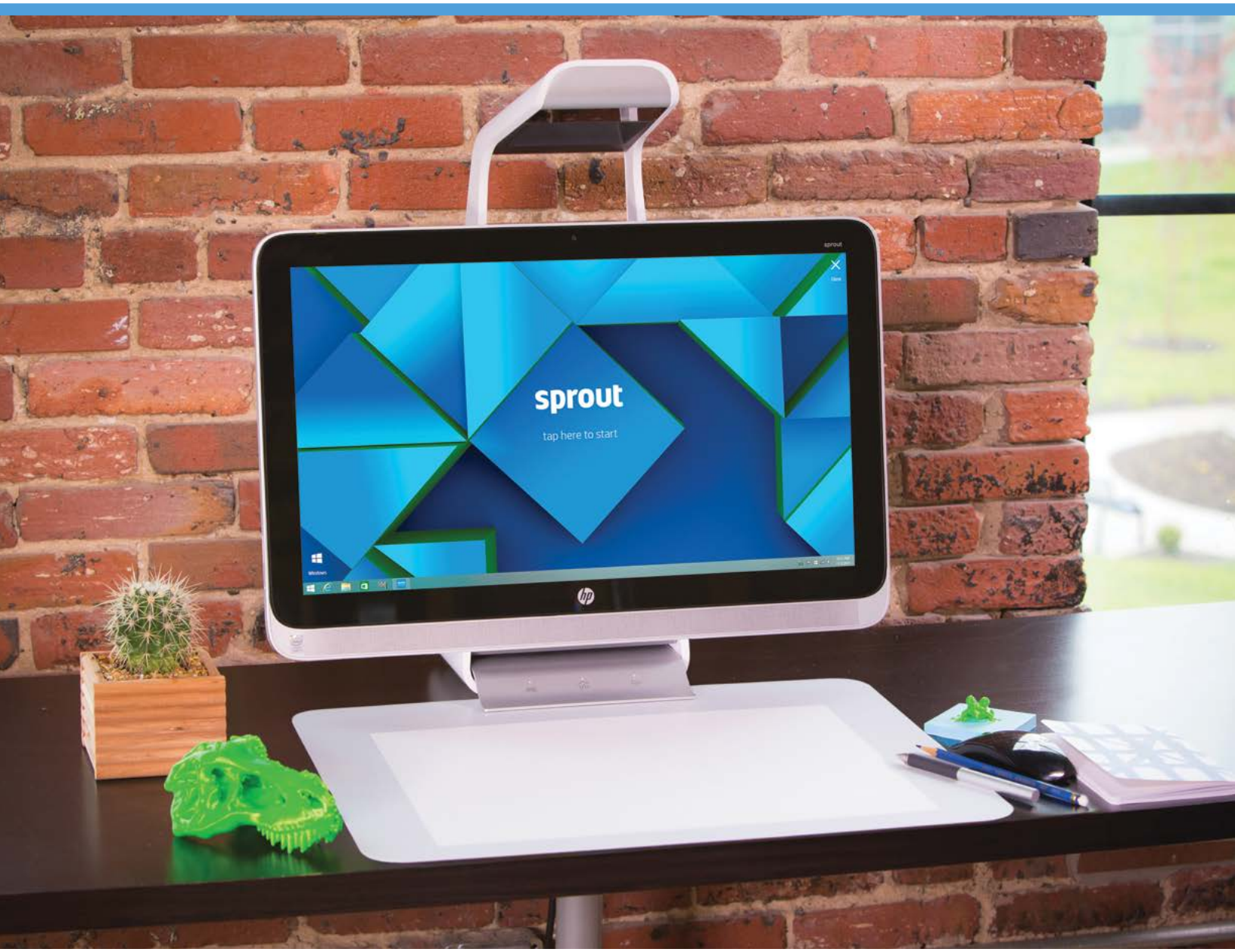
Learning with Sprout

Reimagine what you can make



Edition #1, Fall 2015

Sprout by HP powered by Intel® Core™ i7 processor

Table of Contents

Learn with Sprout

Sprout Activities

Welcome to Sprout!

Sprout is a new kind of all-in-one computer that enables students to make, design, and customize the world around them. Sprout uses a unique combination of technologies and experiences that support modern learning and exploration.

Designed to engage students in collaboration, communication, and critical thinking, Sprout's support of these 21st century skills makes it a critical evolution to the modern learning environment.

While Sprout is right at home in a classroom, science lab, library, media center, workshop, makerspace, and any other learning environment, Sprout is a learning environment in itself.

By connecting the physical world with the digital world, Sprout makes it possible to reimagine what you can make.

So, what's inside?

This Sprout in a classroom handbook is designed to give you a starting point for integrating Sprout into your learning environment, and igniting your students' creativity.

Section 1: Through this handbook you will learn how Sprout can enhance educational experiences, support the development of collaboration, communication, and critical thinking skills, improve digital literacy, and empower the imagination of your students.

Section 2: Additionally, this handbook includes a series of adaptable and extensible learning activities that are unique to the interactive capabilities of Sprout. These activities act as an inspiration point for you and your students to begin learning with Sprout.

Learn with Sprout

What is Sprout?

Modern Learning with Sprout

Where to Place Sprout

Cameras

- Webcam and downward facing cameras
- Use as a document camera, capture objects
- Capture portfolios and works in progress; great for project based learning, demonstrations

3D Scanner

- Capture 3D objects
- Grab objects to modify, copy, 3D print, use in creative projects
- Scientific research, measurement, connecting the physical world to digital tools

Projector

- Creates second screen on the TouchMat
- Project onto materials, touch and manipulate captured objects, touchable second screen
- Connect computer work to physical materials for tactile learning opportunities

Powerful Windows Computer

- Runs all your favorite Windows applications
- Use as a normal computer; bring in content captured with Sprout
- Real world computer skills, connect creative Sprout content to apps like Adobe Creative Suite,™ Powerpoint,™ etc.

Touch Mat

- 20-point touch mat + projection screen
- Collaboration, intuitive interaction, creative drawing and sketching
- Group work, accessible for younger ages, art

What is Sprout?

Modern Learning with Sprout

What is Sprout?

Sprout is the all-in-one computer built to help you reinvent the classroom.

Designed by HP, powered by Windows 10 with a 4th generation Intel Core i7 Processor, Sprout provides the technological power you need to transform instruction, increase student engagement, and drive learning outcomes.

Today's students need to build the relevant ways of thinking and working which will prepare them for tomorrow's challenges. With Sprout at the center of learning, you and your students will be empowered to reinvent.

Sprout provides access to a robust world of learning. In addition to a 23" 10-point touch-enabled Integrated Display, webcam, keyboard, mouse, and stylus, Sprout has a durable second display, at your fingertips. This HP Touch Mat is a 20" 20-point touch-enabled interaction surface that when combined with the projection and scanning capabilities of the

The Sprout inspires and gives a sense of awe and wonder in students – it inspires passion.

– Deneen Crandall
Director of Gifted
The Village School Naples

Sprout lets you incorporate physical objects so easily, to really bridge the physical / digital divide.

– Shannon
High School Student

HP Illuminator, makes Sprout the connection point between the physical and digital world. When Sprout is combined with the 3D printing capabilities like those of the Dremel 3D Idea Builder the possibilities to capture, customize, and make are made accessible to every student.

And because all Sprout interaction surfaces — including the Integrated Display and the HP Touch Mat — handle multiple touch points, Sprout can be used by multiple students at the same time. Sprout engages all of a student's senses while supporting both collaboration and personal exploration.

Sprout is the all-in-one computer built to help students work together, explore together, solve problems together, and reinvent together.

How does Sprout help educators reinvent instruction?

In response to a changing world, teaching and learning have come to emphasize the importance of problem solving, collaboration, and critical thinking. Sprout supports these essential skills through a platform that inspires creativity and communication.

In support of these skills, Sprout can be used as a content system for teachers. For everything from the delivery of in-person presentations to multi-camera media content made for the flipped classroom, Sprout delivers functionality in tune with both the technological and pedagogical needs of educators who strive for data-driven learning outcomes through inspiring and engaging instruction.

For instance, bolstered by strong evidence collected by the Institute of Education Sciences (IES), the U.S. Department of Education has recommended teaching academic vocabulary to elementary and middle schoolers by working intensively over a series of days using a variety of instructional approaches — by unifying multiple visual, sonic, and hands-on approaches

What do we need to do to facilitate self-directed learning?

Sit them in front of a Sprout.

Sprout provides a space for independent creativity and playful exploration.

– Laura Fleming
Library Media Specialist
New MIlford High School

Sprout gives you a better way to present your learning.

Capture is a quick, clean, easy way to bring content in for presentations, and document projects to demonstrate your learning.

– Isabella
High School Student

through a single device, the Sprout offers an ideal way to support variety in instruction.

Sprout offers an accessible, engaging platform for exploration and creativity that can extend and enrich any curricular content, while increasing self-directed student engagement driven by inquiry-based and personalized learning. Sprout also provides students with a means of creating their own learning tools.

According to IES, there is strong evidence that mathematical problem solving in middle school can be improved by teaching students how to use visual representations — in its unique ability both to turn any 2D or 3D object into a visual representation or to support the creation of new physical objects via a 3D printer, Sprout can be an integral piece of the personalized learning experience .

By encouraging students to use all of the features of Sprout — to research, create, and share — teachers can leverage next-generation technology to support instruction and drive data-driven learning outcomes.

How does Sprout help to reinvent the learning environment?

The learning environment has a direct impact on student learning outcomes, and new research shows that well designed classrooms can boost the progress of learning.

Sprout offers educators the opportunity to reinvent the classroom space and to use technology and environmental design to encourage collaboration and learning outcomes.

Collaboration becomes a tactile and physical experience through Sprout's Integrated Display and HP Touch Mat. Each of these aspects of Sprout support concurrent multi-touch interaction, meaning that students can truly participate in their learning together. Students can manipulate objects independently, but work together toward

completion of a single project or learning goal, driving conversation and facilitating collaboration through shared experiences.

Sprout also makes remote collaboration an interactive experience by moving beyond a single screen. Through HP MyRoom, students can share, present, and engage through multi-screen video. Students can connect remotely to students in another classroom, learn from a distant expert mentor, or participate virtually in a field trip. The ability to physically manipulate images and objects within these contexts opens up all new collaborative possibilities.

Through the tactile interaction that Sprout enables, teachers and students engage with content in multiple modalities. By leveraging Sprout's blend of tactile, visual, and sonic sensory engagement, educators are offered powerful means of differentiating instruction and personalizing learning in the classroom in a way that no other computer can support.

Sprout helps to reinvent the classroom itself.

Reimagine learning... with Sprout.

Sprout allows creativity to drive the learning experience, inspiring teachers and students alike to explore and interact in new ways.

Sprout makes it possible to explore and to engage with content in meaningful and personal ways. And Sprout opens up new ways to leverage both the digital and physical worlds to inspire and to encourage the development of problem solving, collaboration, and critical thinking.

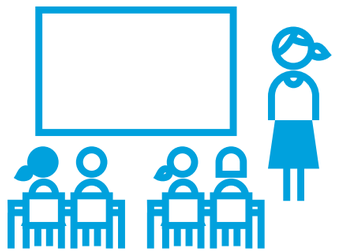
Use Sprout to reimagine learning and to reinvent the classroom.

Sources

Institute of Education Sciences, U.S. Department of Education. <http://ies.ed.gov/>.

Barrett, Peter, Fay Davies, Yufan Zhang, and Lucinda Barrett. "The Impact of Classroom Design on Pupils' Learning: Final Results of a Holistic, Multi-level Analysis." Building and Environment, 20 Feb. 2015. <http://www.sciencedirect.com/science/article/pii/S0360132315000700>.

Where to Place Sprout

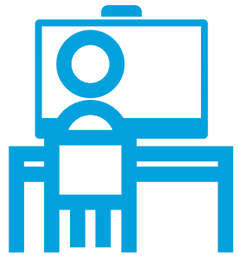


Teacher Station

- Live presentations from display, mat, and cameras
- Document capture
- Recording tutorials
- Remote collaboration
- Standalone computer

Classroom Station

- Project documentation
- Live media creation and capture
- Multi-student projects and content creation
- Media capture and creation station
- Standalone computer



Student Computer

- Primary computer used by students
- Individual or shared computer
- Media rich capture and manipulation
- Standalone computer

STEM Class or Makerspace

- 3D scanning and printing
- Remote collaboration with HP MyRoom to share and get feedback on projects with mentors and experts
- Size Up for instant measurement of any object you place on the mat
- Standalone computer

Arts Class or Workshop

- Scanning craft materials for collage
- Tracing onto craft materials like cloth, wood
- Modeling in clay, scanning to 3D model
- Standalone computer

Library

- Capture student work
- Capture library resources for study reference
- Collaborative research
- Explore 3D resources from the Smithsonian
- Create media to document knowledge
- Standalone computer

Sprout Activities

Capture 2D

Capture 3D

Mashups & Layouts

Stop Motion

Tracing & Stenciling

Collaboration

Lesson Delivery

Video Capture

2D Capture

What is 2D Capture?

Sprout's Capture and Doc Scan apps produce high-resolution, full-color images and digital objects with just a few simples taps.

By placing multiple objects on the HP Touch Mat and then using 2D Capture to scan the objects, Sprout can capture multiple objects at once, remove the background, and turn each object into a separate image that can be manipulated independently.

Once objects have been captured, students can combine, edit, remix, and use these 2D images for portfolio documentation, collages, art projects, science reports, and other creative projects.

Captures can be shared to other creative applications for presentations, documents, etc; just copy and paste or save to a folder and insert from another app.

Hands-on with 2D Capture

Document Capture

Easily scan homework, worksheets, or other documents with the Doc Scan app.

Portfolio Capture

Sprout makes it easy to capture artifacts for student portfolios, including physical objects, project stages and other work to create digital portfolios.

Science Lab Documentation

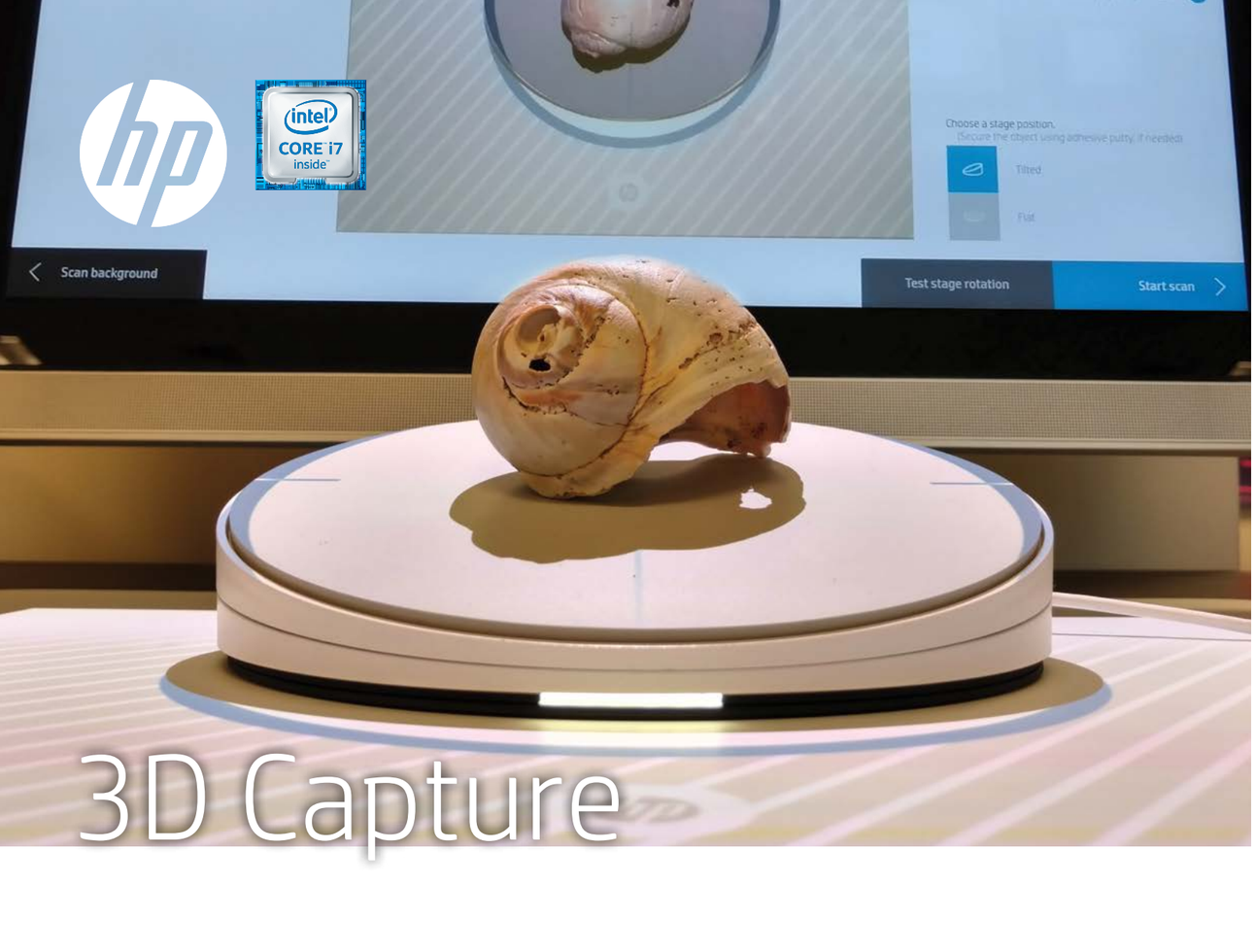
Students can capture the process of lab experiments, to include alongside notes and other annotations for their final lab report.

Artifact Collection

Students can gather and capture artifacts from their neighborhood, community, school, or field trip such as leaves, coins, toys, found objects, and rocks. These artifacts can then be used in reports, projects, and other creative activities.

Capture Colors and Textures

Capture colors, textures, and objects to import into design apps like Adobe Illustrator and Photoshop. Use your captures to create backgrounds and bring textures into your design projects.



3D Capture

What is 3D Capture?

Sprout's 3D Capture app produces high-resolution, full-color, three-dimensional scans of objects with just a few simples taps. 3D Capture digitizes both color and depth information about objects so that students can bring them into the Sprout Create Studio.

Once in the Sprout Create app, models can be edited, investigated, mashed, enhanced, and re-purposed for many creative projects. Models can be manipulated, explored, and customized in Meshmixer and Microsoft 3D Builder.

You can also save a 2D perspective of any scanned object to view and manipulate in Create or any other design application for presentations and creative documents.

Hands-on with 3D Capture

Model in Clay, Scan in 3D

Students can use modeling clay to design and build their own objects and then scan it to create the beginning of a 3D model that they can then manipulate, remix, and print.

Structured Light

The mechanics of 3D scanning are a great topic for a science, math, or art project. Sprout uses a method called structured light; exploring this method is a great inquiry-based learning opportunity.

Scan for Scientific Research

Collect objects for scientific research; objects like fossils, rocks, leaves, etc are a great source material. Scan the objects to document them, make models, detailed comparisons, and explore for scientific study.

Scan to Document a Project

For complex, multi-stage projects, like a multi-stage art project, scanning versions at every stage will document progress that students can share with mentors and peers.

Digital Dissection

Using the 3D Capture app, multi-part models of objects can be scanned in their individual parts, Students can disassemble models, like a heart, a frog, a gear, or a puzzle, and then reassemble the model digitally to get an in-depth view of how all the parts work together.

Mashups and Layouts

What are Mashups and Layouts?

Mashups are multi-dimensional, mixed-media, object compilations that are made possible by the special capture abilities of the Sprout. Sprout lets you play with copies of physical objects to create new works of art, science, and presentations.

You can start with templates in the Sprout Create app to create presentations, flyers, announcements, collages, cards, and other media-rich documents. Or you can start with a blank space to create entirely new material with engaging content by mixing different digital objects and models together.

Mashups and layouts are a great tool for anything from a science report document to collaborative collage presentations, and can be the starting point for content exploration. You can also use objects and designs from a mashup in other design apps like InDesign and Powerpoint.

Hands-on with Mashups and Layouts

Annotated Scientific Samples

Students can use 2D Capture to document scientific samples, then make notes and annotations in a Mashup.

Visual History Report

By bringing in historical images and source documents to the Create app, Students can use the marker and text tools to explain how the images relate to one another to better comprehend historical events in a visual format.

Collage

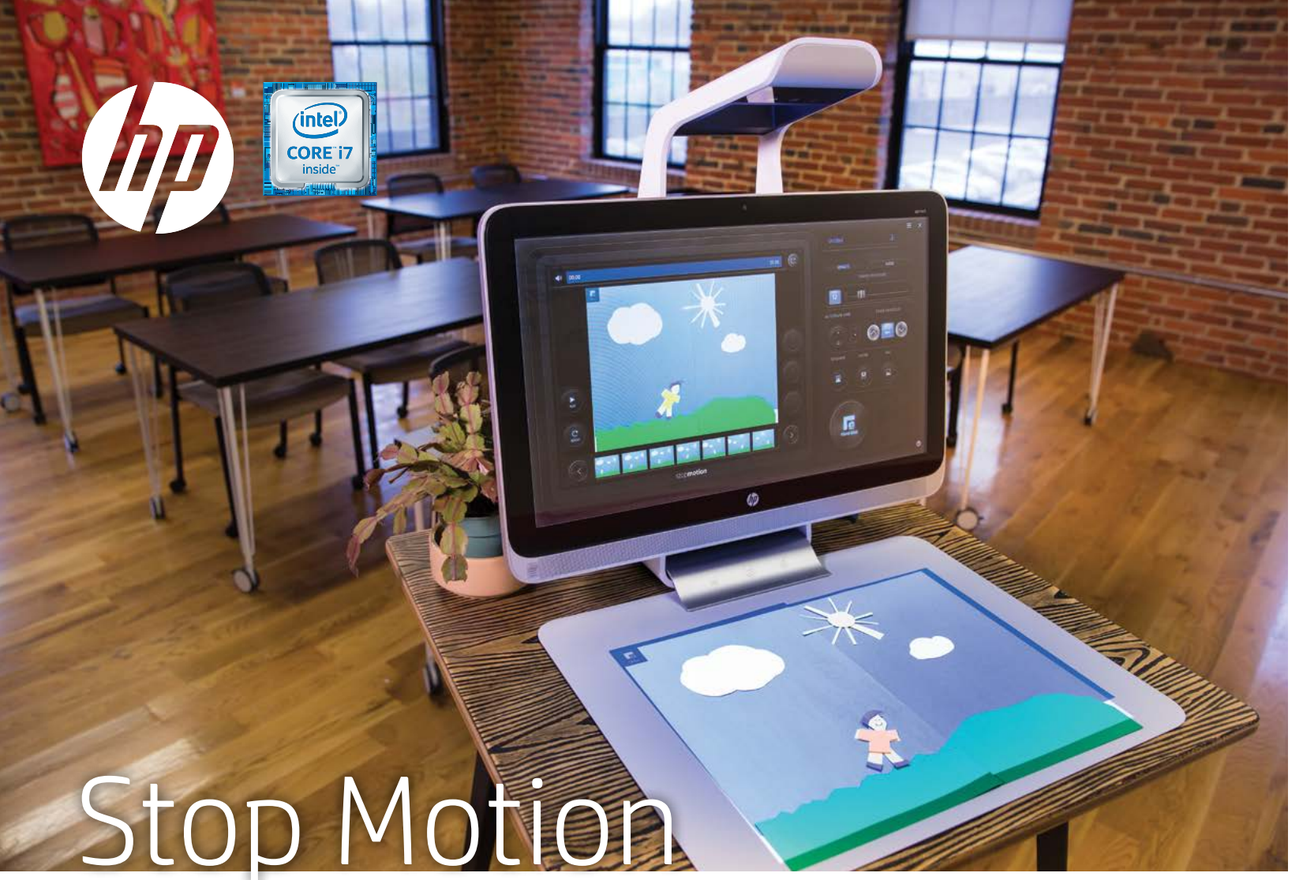
Scan collected objects, favorite items, classroom supplies, crafts, textures, flowers, and any other objects to use in the creation of collages that explore content, scientific concepts, novels, student research, and other student ideas.

Announcements and Cards

Design an announcement poster or thank you card for an upcoming event. Use items from the classroom to make it personal and fun.

Mood and Inspiration Boards

Capture materials, pictures, and objects that inspire you, then gather them in a mashup to create a mood or inspiration board for a creative project, event, etc.



What is Stop Motion?

In Sprout's Stop Motion app, students can record and animate physical objects captured over time, frame by frame, to create stop motion animation videos. Stop Motion is a very flexible and playful style of animation, and can be done with simple paper cutouts and everyday objects to carefully modeled clay figures.

Using the HP Illuminator's downward facing cameras, the Stop Motion app makes capturing, editing, and creating stories in film intuitive for students, while allowing for a multi-modal process that drives student engagement through content creation and creativity.

Objects and models can be used from the computer or captured from the HP Touch Mat. Captured stills and clips can be also be shared and mixed with traditional video and other media using Premiere or other video editing apps.

Hands-on with Stop Motion

Life Cycles

Show the life cycle of a cell, plant, or animal through drawings or paper cut-outs.

Narrative Summary

Create a short animation summarizing a story the class recently read. Students can be challenged to think about how to best communicate the most important ideas from the story using only visual elements.

Personal Storytelling

Students can share a short story from their own personal experience or of their own creation, then plan and direct an animated video telling their story.

Class Promotion

Make a short stop motion video to promote something the class wants to get family and community support around. Post the video to social media as a way to get your message heard.

Great topics could be anything from a social cause your class is learning about, an event students want to promote, or a fundraiser for a school project.

Tracing and Stenciling

What are tracing and stenciling?

Sprout's Light Stencil app makes it possible to capture an image, then project it onto the HP Touch Mat for you to use as a drawing guide. Using Light Stencil as a creative tool, you can draw directly from a reference to create larger objects, outlines, and project templates.

You can also use the Sprout 2D Capture app to photo of a 3D model for you to then work from, which has many applications for still life drawing and scientific sketching.

The Touch Mat can be locked in order to draw and sketch with paper and normal art tools or other physical media like canvas, wood, and fabric.

Scale and adjust your image to just the right size and arrangement, then transfer to any physical media with no need for tracing paper or guesswork.

Hands-on with Tracing and Stenciling

Still Life Drawing

Set up objects on the HP Touch Mat, grab a snapshot, and create a still life drawing based on the captured image.

Trace and Decorate Your Favorite Character

Find a picture of your favorite animated character, capture it with Sprout, then create your own version, with custom colors and decorations. Students can focus on understanding how tone and style impact narrative and visual presentation.

Field Journal and Logbook

Use the Sprout to grab a snapshot of a natural object, then use Sprout's tracing setup to do a scientific sketch. Students can annotate the original object using the Create app as their field journal or Logbook.

Inking and Coloring a Sketch

Comic and graphic illustration often pass through several stages which can be documented with Sprout, especially because the inking and coloring happen as a separate process, after the sketches are complete. Students can use Sprout to grab snapshots of their sketches and then add color and outlines for the final product digitally.

Pattern Transfer

Use the Light Stencil app to transfer patterns and motifs to physical media for crafts like embroidery, beadazzling, wood burning, wood cutting, and sewing.

Collaboration

What is Sprout Collaboration?

Sprout's remote collaboration tool is HP MyRoom. MyRoom allows you to work together on projects in real-time, share your screen, the Touch Mat, and other applications while talking directly with others on the Sprout.

Sprout and MyRoom have powerful built-in collaboration tools, including a 'whiteboard' space that collaborators can draw on together, and the ability to grab a snapshot of an object or document with Sprout and then annotate or manipulate that object in a shared space.

To use MyRoom, simply invite collaborators by putting their email address in when you've launched Myroom. Myroom allows several devices, including tablets and phones, to simultaneously participate in the collaborative space.

Hands-on with Sprout Collaboration

Remote Mentor

Students can get real-time feedback from a mentor on a design or engineering project, using Sprout's Capture app capabilities to share prototypes and get feedback live.

Class to Class Collaboration

Collaborate and connect with another class, in the same school or far away. Put together a collage, share scans of objects from your class, talk about what life is like for each class.

Group Competition

Choose a topic for competition and find another class who wants to compete, then use Sprout's MyRoom to share your finished work with each other.

Virtual Field Trip

Go on a virtual field trip, where the space you're visiting would not otherwise be accessible to your group. Visit a science lab or research facility from across the world; touch and play with scanned objects the host shares with you.

Lesson Delivery

What is Lesson Delivery with Sprout?

Sprout is a great tool for lesson delivery. You can use the External Display Mixer app to share materials, use the touch mat like a smartboard, and connect to a projector or large display with Sprout's third screen HDMI output.

The app also allows you to zoom in up to 4x with the downward facing camera, effectively turning Sprout into a shared magnifying glass for examining specimens and artifacts.

The flexibility you get with Sprout for displaying content really enables a flexible and interactive presentation modality. This presentation capability is great for student presentations as well as teacher-led content.

Hands-on with Sprout for Lesson Delivery

Live Demonstration

Present a live demonstration, particularly for complex tasks like complicated math problems, science projects, language diagramming, and other multi-step or multi-concept activities.

Student Presentations

Students use the third display function of Sprout to share their work with the class, annotating on screen with the HP Touch Mat.

Direct Feedback

Show feedback to students in real-time, marking up the document visually with the HP Touch Mat while projecting, and verbally narrating the feedback you have for them.

Group Science Exploration

Use Sprout's document camera to share a special object with a whole class of students via the third screen projection or display. This way objects that are too small, rare, or fragile to be handed around the classroom can be shared and explored by everyone.

Video Capture

What is Video Capture?

Sprout has three built-in recording devices, the Webcam that that faces you, the HP Illuminator camera which faces down onto the Touch Mat like a document camera, and the main display which has screen recording capabilities.

These three cameras can be used together in the Video Capture app. You can actively use up to two cameras at the same time, allowing you to record multiple perspectives simultaneously.

With the Video Capture app you can easily demonstrate interactions with an object, including documents, tools, or other resources, on the Touch Mat camera, while also sharing your display, for software interaction, videos, or document reference, and record directly from your webcam.

Hands-on with Video Capture

Demonstrate Learning

Students can use Sprout's multi-camera setup to record a statement and show off projects that demonstrate their learning in an interactive, media-rich format.

Flipped Lesson

In a typical flipped classroom, teachers record video content for students to review in advance of class, so that class time can be spent working on the content together. Sprout's webcam, screen recording feature, and the HP Touch Mat's downward facing camera make it easy to record complex instructional content in an engaging and personal format.

Peer Tutorial

Students can demonstrate their mastery of a topic or skill by documenting a step by step process for peers. Hands-on projects like robotics and other constructed objects are a great focus area for peer tutorials.

Science Lab Walkthrough

Short videos that demonstrate key points of a science lab or challenging math and language arts exercises can be recorded and made available to students so that students have an accessible resource when doing homework and other independent work.

Activity Index

Capture 2D	
Document Capture	Documentation, any topic
Portfolio Capture	Documentation, any topic
Science Lab Documentation	Science
Artifact Collection	Science

Capture 3D	
Model in Clay, Scan in 3D	3D modeling, Math
Scan and Customize	3D modeling, Math
Scan for Scientific Research	Science, Math
Scan to Document a Project	Documentation, any topic
Digital Dissection	Science

Mashups and Layouts	
Annotated Scientific Samples	Science, Math
Visual History Report	History
Collage	Art, etc
Announcements and Cards	Media

Stop Motion	
Life Cycles	Science
Narrative Summary	Language
Personal Storytelling	Language
Class Promotion	Media

Tracing and Stenciling	
Still Life Drawing	Art
Decorate Favorite Character	Art, language
Field Journal and Logbook	Science
Inking and Coloring	Art

Collaboration	
Remote Mentor	Project based learning, Maker, etc
Class to Class Collaboration	Art, History, Math, Language, Science, etc
Group Competition	Art, History, Math, Language, Science, etc
Virtual Field Trip	Art, History, Math, Language, Science, etc

Lesson Delivery	
Live Demonstration	Art, History, Math, Language, Science, etc
Student Presentations	Art, History, Math, Language, Science, etc
Direct Feedback	Art, History, Math, Language, Science, etc
Group Science Exploration	Science

Video Capture	
Demonstrate Learning	Language, Documentation, etc
Flipped Lesson	Art, History, Math, Language, Science, etc
Peer Tutorial	Project based learning, Maker, etc
Science Lab Walkthrough	Science

More Sprout Resources

Tutorials and how-to's:

http://sprout.hp.com/us/en/resources/

https://www.youtube.com/user/hpsupport

Inspirational projects:

http://sprout.hp.com/us/en/creator/

Where to see, try, buy:

https://sprout.hp.com/us/en/search-locator/

Educators are doing amazing things with Sprout.

We'd love to hear what you're doing with Sprout! Let us know what you're doing with Sprout by sharing with this tag:

#gomakethings

Sprout by HP powered by Intel® Core™ i7 processor

4AA6-3284ENW, November 2015