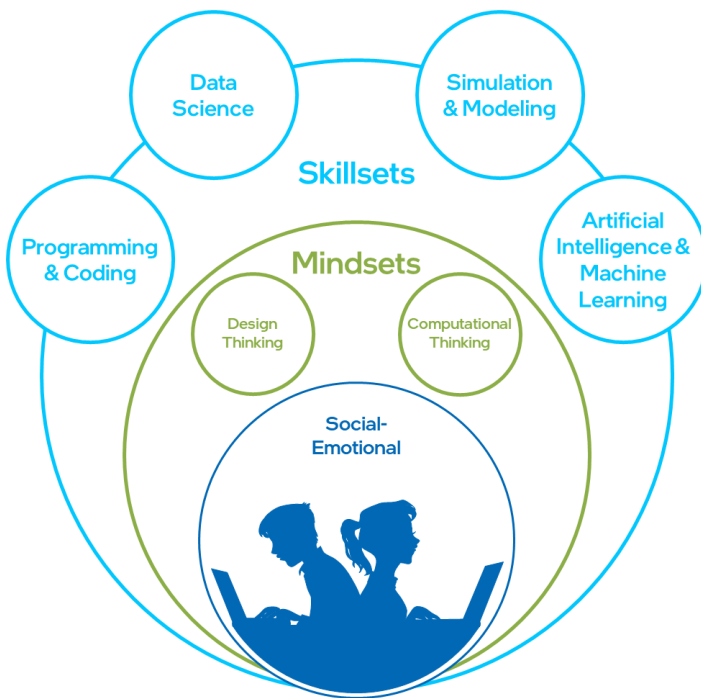






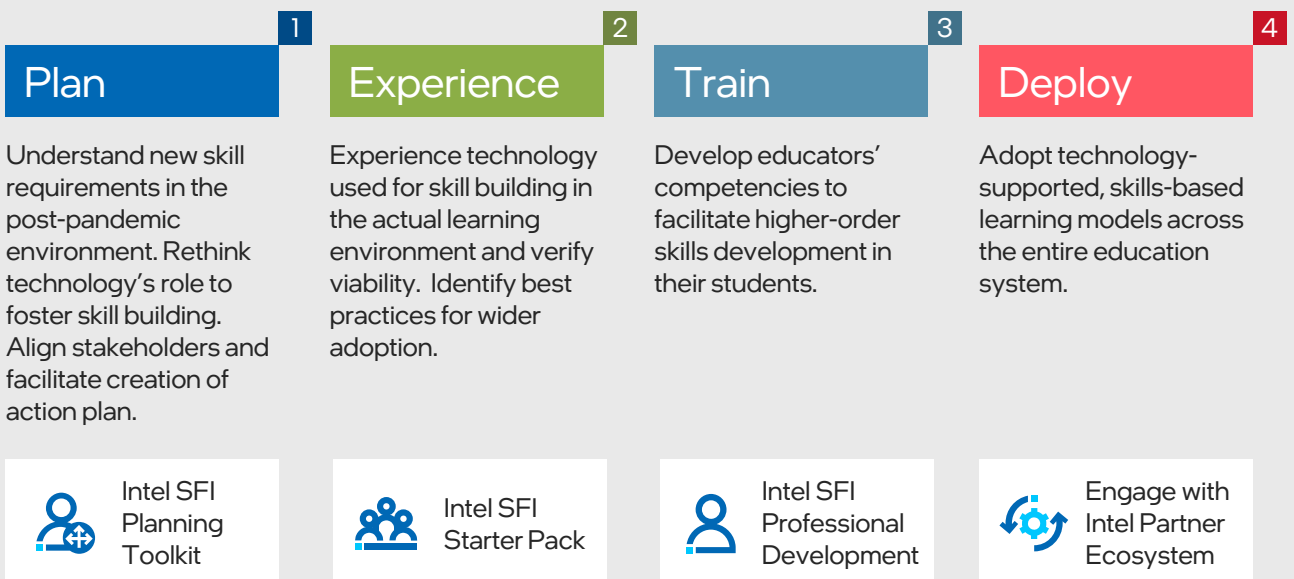
# Intel® Skills for Innovation



La quatrième révolution industrielle implique des mutations. Dans ce contexte, Intel® Skills for Innovation (Intel® SFI) ambitionne d'offrir aux élèves les compétences nécessaires pour devenir des innovateurs, tout en imaginant et en créant les emplois de demain.

Cette approche guide les décideurs et les enseignants qui veulent intégrer des activités liées à la technologie dans leur programme afin de développer des états d'esprit et des compétences essentiels.

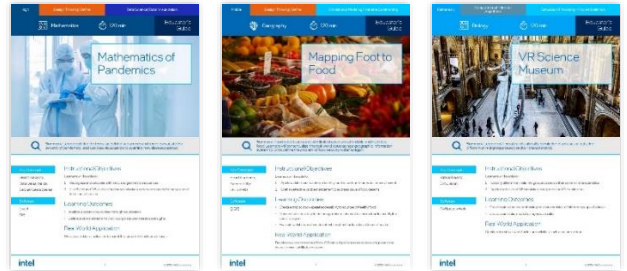
## Path to Adopting Intel Skills for Innovation



# Introduction to Intel® SFI Starter Pack

The Intel® Skills For Innovation (Intel® SFI) Starter Pack allows educators to experience the Intel SFI vision and establish an innovation environment by providing ready-to-use, technology-infused learning experiences that develop skills of the future for their learners. With a growing library of 70 activities spanning 140 hours of content across various subjects for K-12 schools, educators are able to effectively integrate innovation skills supported by digital technologies into their existing curriculum. Starter Pack activities can be conducted virtually or in a school environment. They also provide excellent project material for flipped classrooms.

The Intel SFI Starter Pack is hosted on the Intel SFI Platform, which offers educators access to an interactive, engaging and collaborative learning community.



## Why is it a “Starter Pack”?

The Intel SFI Starter Pack is meant to get educators started on the path to integrating technology-infused skill-building activities in their lesson planning. To build educators’ capacity to create such activities on their own, the Intel SFI framework provides another program - Intel SFI Professional Development.

## Design of the Intel SFI Starter Pack

The Intel SFI Starter Pack maps innovation skills under the Intel SFI Framework to existing curriculum to create technology-infused learning experiences and deliver innovation outcomes that build skills of the future.

Mindsets**	Education Level + Subject	Technology Usage	Creation of New Learning Experiences	Innovation Outcomes
<p>Design Thinking</p> <p>Computational Thinking</p> <p>Socio-Emotional Skills</p> <p><b>Skillsets**</b></p> <p>Simulation &amp; Modeling</p> <p>Programming &amp; Coding</p> <p>Data Science</p> <p>AI &amp; Machine Learning</p>	<p>Segmented into elementary, middle and high school levels.</p> <p>Activities cover the following subject areas: STEM, humanities and language arts.</p> <p>Selection of topics which offer higher potential for technology integration.</p>	<p>Use of cloud-based software for 3D modeling, simulation and data analysis.</p> <p>Use of programming software installed on laptops or PCs.</p> <p>Use of digital fabrication tools such as 3D printing and laser-cutting (for selected lessons).</p>	<p>Ready-to-use activities for educators and learners.</p> <p>Each activity comes with:</p> <ul style="list-style-type: none"><li>• Educator guide</li><li>• Class presentation</li><li>• Working files</li></ul>	<p>Ability to create, evaluate and analyze (higher-order cognitive skills).</p> <p>Developing innovation mindsets of learners.</p> <p>Improved readiness for the demands of the Fourth Industrial Revolution.</p>

# Exploring an Intel® SFI Starter Pack Activity

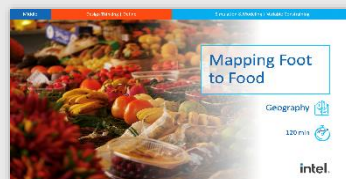
Each Intel® SFI Starter Pack activity is a complete resource for educators and is designed to support educators with specialization in different curriculum subjects. With an estimated duration of 2 hours, each activity comprises a comprehensive educator’s guide, a teaching deck and a folder containing various resources that are required to carry out the activity.

The Intel SFI Starter Pack activity can be conducted on a Windows or Chromebook\* platform.

## Detailed Contents

### Educator’s Guide

- Learning objectives
- Lesson overview
- Activity guide
- Troubleshooting tips
- Assessment & rubrics

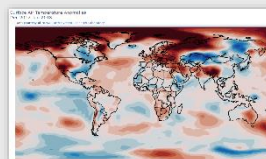


### Teaching Deck

- Introduction to topic
- Hands-on activities
- Guided learning
- Discussion topics
- Reflection

### Working Files

- Worksheets
- Installation guides
- Applications
- Source files or codes
- Data sets



Year	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020
North America	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0
Europe	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0
Asia	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.5	22.0
Africa	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0
South America	18.0	18.5	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0
Australia	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0
Antarctica	-50.0	-45.0	-40.0	-35.0	-30.0	-25.0	-20.0	-15.0	-10.0	-5.0	0.0	5.0	10.0	15.0	20.0

\*Refer to the Intel SFI Starter Pack glossary for the list of activities that can be conducted on a Chromebook.

# Understanding the Intel® SFI Starter Activity

The Educator's Guide provides educators with detailed information about what to expect when they carry out the activity in the classroom.

**Grade level** → Elementary

**Subject area** → Biology

**Duration** → 120 min

**Mindset** → Computational Thinking | Algorithms

**Skillset** → Simulation & Modeling | Problem Definition

**Each Starter Pack activity focuses on at least one mindset and skillset under the 7 innovation skills. All 70 activities are designed to develop social-emotional skills in learners.**

**Key concept covered in each activity is highlighted.** → Key Concepts: Virtual Reality, Simulation

**Technology used – A variety of technology ranging from programming to cloud-based software has been selected for the 70 activities.** → Software: CoSpaces Web

**This section integrates both the learning objectives of the topic in the subject as well as the outcome of a tech-infused lesson. An example of a real-world application is also included to show the relevance of this activity beyond the classroom.**

**Summary:** Learners will create a virtual reality simulation of a museum featuring different animal groups based on their characteristics.

**Key Concepts:** Virtual Reality, Simulation

**Software:** CoSpaces Web

**Instructional Objectives:** Learners will be able to:  
 1. Classify different animals into groups based on their common characteristics  
 2. Apply the basics of VR simulation using an online 3D creation tool

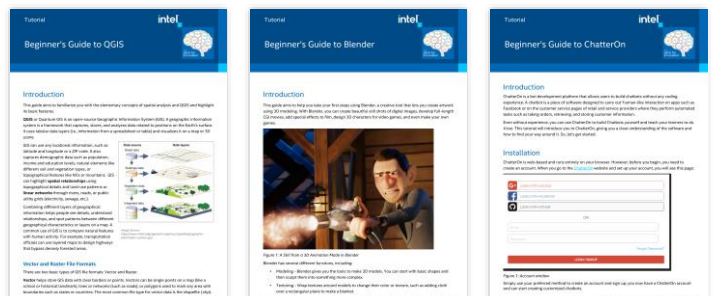
**Learning Outcomes:**  
 • Create a virtual museum showing the characteristics of different groups of animals  
 • Create a simulation model using virtual reality

**Real World Application:** Creation of a virtual world for leisure activities, such as an online tour.

intel | 1 | © 2021 Intel Corporation

## New to the Technology?

Beginner's guides have also been created for educators who are interested in finding out more about how to use and apply the software or technology introduced in the Intel® SFI Starter Pack activities. As a supplementary resource, the guides provide additional support to educators in using technology with greater confidence.





# Intel® SFI Starter Pack for K-12 Schools

The Intel® SFI Starter Pack activities are categorized into various subject areas across K-12 grades, enabling educators to select activities that match their areas of specialization. Through these activities, educators provide learners with new experiences in learning the topics within the subject area.

## Categorization of Intel SFI Starter Pack Activities

	Languages	STEM	Humanities
<b>Elementary</b> (15 Activities)	<ul style="list-style-type: none"> <li>English</li> <li>Literature</li> </ul>		<ul style="list-style-type: none"> <li>Geography</li> <li>History</li> <li>Social Studies</li> </ul>
<b>Middle</b> (25 Activities)	<ul style="list-style-type: none"> <li>English</li> <li>Literature</li> <li>Language Arts</li> </ul>	<ul style="list-style-type: none"> <li>Mathematics</li> <li>Biology</li> <li>Chemistry</li> <li>Physics</li> </ul>	<ul style="list-style-type: none"> <li>Geography</li> <li>History</li> <li>Social Studies</li> </ul>
<b>High</b> (30 Activities)	<ul style="list-style-type: none"> <li>English</li> <li>Literature</li> <li>Language Arts</li> </ul>		<ul style="list-style-type: none"> <li>Economics</li> <li>Geography</li> <li>History</li> <li>Social Studies</li> </ul>

## Curriculum Integration

Each Intel SFI Starter Pack activity has been designed for seamless integration into the local curriculum. Curriculum mapping to the United States Common Core Standards and Singapore National Curriculum are currently available. Refer to the Starter Pack Catalogue for a comprehensive list of these curriculum maps.

High School	Activity Title	Description	Supporting Technology	Midst	Skillset	Chrome Book
1	Language Arts	<i>AI Roleplaying</i> Experience game-based learning in creative writing using AI Dungeon to simulate text adventures.	Software used: AI Dungeon	Comp. Thinking: Algorithms	AI & Machine Learning, Natural Language Processing	✓
2	Social Studies	<i>Anatomy of Safety</i> Learn how to use 3D game engines to discover potential danger zones or fall areas for senior citizens.	Software used: Unity	Design Thinking: Define	Simulation & Modeling, Problem Definition	✓
3	STEM (Physics)	<i>Architecture of Wind</i> Learn how architects test to see if the tall buildings they are designing will be able to withstand strong winds.	Software used: Ansys 3D, Ansys Virtual Wind	Design Thinking: Test	Programming & Coding, Iterative Refinement	✓
4	History	<i>As A Matter of Fake</i> Learn how to differentiate fake news or deliberate online falsehoods by analyzing text using natural language processing.	Software used: Python, Jupyter Notebook	Comp. Thinking: Patterns Recognition	AI & Machine Learning, Natural Language Processing	✓
5	STEM (Math)	<i>Berford's Law</i> Create a computational experiment using the Monte Carlo Method and Markov Chain to solve complex problems.	Software used: Python, Jupyter Notebook	Comp. Thinking: Abstraction	Data Science: Data Modeling	✓
6	STEM (Math)	<i>Big O Notation</i> Learn about Big O Notation and how it is used in coding to explain the complexity of an algorithm.	Software used: Python	Comp. Thinking: Decomposition	Programming & Coding, Iterative Refinement	✓
7	History	<i>Causes of Genocides</i> Investigate the causes of genocides through data wrangling to prepare data for trend and correlation analysis.	Software used: Python, Jupyter Notebook	Comp. Thinking: Spreadsheets	Data Science: Data Wrangling	✓
8	Geography	<i>Clean Water</i> Investigate the relationship between a lack of access to good sanitation and child mortality using Spaximeter.	Software used: Spaximeter, InkScape	Design Thinking: Prototype	Data Science: Data Visualization	✓
9	STEM (Physics)	<i>Da Vinci Bridge</i> Reconstruct the historical Da Vinci Bridge without nails or ropes using laser cutting.	Software used: InkScape	Design Thinking: Prototype	Simulation & Modeling, Model Development	✓
10	STEM (Biology)	<i>Diversity of Flowers</i> Investigate how diversity enables flowers to adapt to their environment and create lines.	Software used: Python, Jupyter Notebook	Comp. Thinking: Algorithms	AI & Machine Learning, Learning Modes	✓

## List of Intel SFI Starter Pack Activities

For detailed information including learning objectives, platform compability, technology used and innovation skills covered in each Intel SFI Starter Pack activity, refer to the Starter Pack Catalogue.

High School	Activity Title	Description	Curriculum Standard
1	Language Arts	<i>AI Roleplaying</i> Experience game-based learning in creative writing using AI Dungeon to simulate text adventures.	CCSS.ELA-LITERACY.W.9-10.3 Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.
2	Humanities (Social Studies)	<i>Anatomy of Safety</i> Learn how to use 3D game engines to discover potential danger zones or fall areas for senior citizens.	NGSS.HS.ETS.1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
3	STEM (Physics)	<i>Architecture of Wind</i> Learn how architects test to see if the tall buildings they are designing will be able to withstand strong winds.	NGSS.HS.PS.3-1 Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.  NGSS.HS-PS.3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles (kinetic) and energy associated with the relative position of particles (potential).
4	Humanities (History)	<i>As A Matter of Fake</i> Learn how to differentiate fake news or deliberate online falsehoods by analyzing text using natural language processing.	CCSS.ELA.LITERACY.RI.11-12.6 Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness or beauty of the text.
5	STEM (Math/Statistics)	<i>Berford's Law</i> Create a computational experiment using the Monte Carlo Method and Markov Chain to solve complex problems.	CCSS.MATH.CONTENT.HS.ID.A.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
6	STEM (Math/Computer Science)	<i>Big O Notation</i> Learn the Big O Notation and how it is used in coding to explain the complexity of an algorithm.	CCSS.MATH.CONTENT.HS.D.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function in the set of ordered pairs consisting of an input and the corresponding output.
7	Humanities (Social/History)	<i>Causes of Genocides</i> Investigate the causes of genocides through data wrangling to prepare data for trend and correlation analysis.	CCSS.ELA.LITERACY.RI.11-12.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as a reasoned disson from the text, including determining where the text leaves matters uncertain.
8	Language Arts	<i>Clean Water</i> Investigate the relationship between a lack of access to good sanitation and child mortality using Spaximeter.	NGSS.HS.ETS.1-4 Engineering Design: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

# Intel® SFI Learning Platform

The Intel® SFI Learning Platform provides educators and administrators with access to a rich, interactive social learning environment to learn, share, collaborate and connect with a global population of educators. With system-wide reporting and analytics, administrators can access powerful insights to track and support the progress of their staff on behalf of their entire organization.

## Learning

Interactive learning & completion certificates

## Resource Library

Lesson plans, PDFs, videos, beginner's guides, presentations, and much more

## Live Chat

Live 'study group' engagement, group discussions, moderated chat

## Community-Generated Content

Shared lesson plans, best practices, and an opportunity to connect with other professionals through the community



## Live Discussions

Grouped by cohort, topic, subject, and thread

## Live Classroom

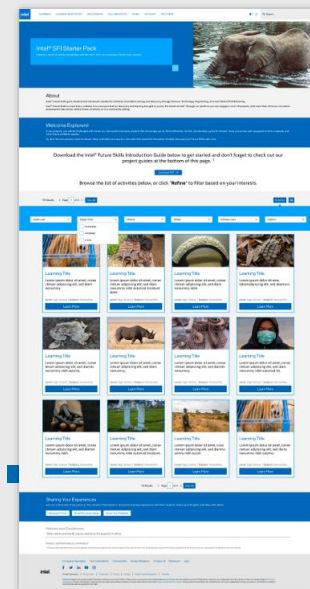
Live training experience with streamed presenter, desktop sharing, polling, and live chat

## Insight Surveys

Capture trends of the innovative approaches to learning and student development

## Intelligent Search

Search categories and filters aligned to educators' interests



## Starter Pack Navigation Page

### Download Starter Pack Catalogue

A complete list of all activities as well as available curriculum mappings.

### Navigate Starter Pack Activities

Quick overview of activity title, brief description, and target level/subject.

### Search Starter Pack Activities Using Pre-defined Filters

Filter activities based on target grade level/subject, target mindset/skillset, software used, and supported platform.

## Starter Pack Activity Page

### Activity Information

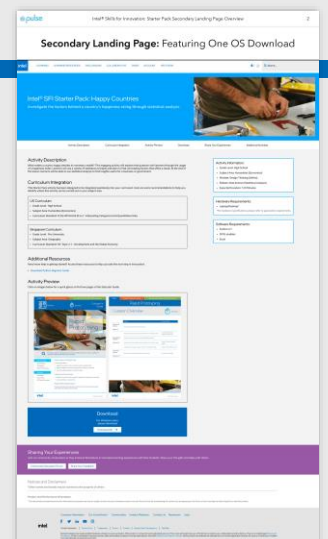
Detailed information and description, hardware/software requirements, and curriculum mapping examples

### Additional Resources

Getting-started guides for teachers to facilitate adoption of software titles used in the activity

### Activity Preview

A closer look at the Educator Guide first two pages with overview of instructional objectives, learning outcomes, and real-world application of the activity







# Ready to Get Started?

The Intel® SFI Starter Pack is designed to meet the evolving pedagogical needs of educators and prepare learners to excel as part of tomorrow's workforce. This program is available under license from Intel.

For more information about how to deploy Intel® SFI Starter Pack in your education environment, please contact your Intel Technology Provider.

For more information, visit  
**[skillsforinnovation.intel.com](https://skillsforinnovation.intel.com)**

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