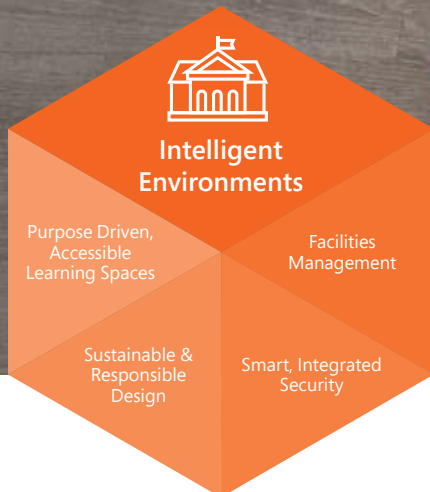


# Intelligent environments



## Quick start guide

Rethink how you configure, use and manage learning spaces.



## Build learning spaces that respond to learners

Learning spaces are evolving to support more fluid, collaborative and personalized learning. They're also becoming more sustainable, efficient and secure. To help you achieve a more intelligent environment in your school, the Microsoft Education Framework recommends focusing on four core components.

### What does an intelligent environment look like?

An intelligent learning environment empowers creative collaboration by students, educators and leaders in flexible learning spaces. It enables more sustainable and energy-efficient ways of working and more responsive and coordinated security to keep learning communities safe. It also helps administrators manage facilities more efficiently to maximize learning while cutting cost.

### How can we work toward it?

Using responsible design principles, we can configure each learning community's environment to create purpose-driven and accessible learning spaces backed by smarter security and facilities management. The Microsoft Education Transformation Framework provides guidance and best practice to help you.

### What's the Microsoft Education Transformation Framework?

The Microsoft Education Transformation Framework is an effective, flexible platform for education transformation. To develop it, we combed the latest research and consulted hundreds of academics, experts and policy makers. We distilled the key insights into a single powerful framework now available to school leaders everywhere. It's an excellent starting point for building a more intelligent environment for learning.



Education Transformation Framework  
[microsoft.com/education/leaders](https://microsoft.com/education/leaders)

# What are intelligent environments all about?



Purpose-driven, accessible learning spaces	Sustainable and responsible design	Smart integrated security	Facilities management
It's about matching physical learning spaces and furniture with learning goals to achieve more flexible spaces that let learners choose how they learn. One strategy is to build learning labs and studios next to common areas, quiet zones and collaborative spaces. A low-fi approach is to split existing spaces into specialized zones.	It's about creating healthy and thriving environments with plenty of fresh air, light and natural views. Healthy buildings can help keep learners alert, positive and engaged by optimizing lighting and climate control via sensors. By reducing cost and environmental footprint, they can also free resources to invest in learning.	It's about using intelligent safety systems to proactively make schools safer and reduce bullying and other threats. Such systems can track people and assets, alerting the school community to safety issues. They can also control access to school facilities dynamically, aiding emergency response.	It's about using the Internet of Things (IoT), the cloud and data analytics to manage complex school environments more efficiently. Connect digital whiteboards, computers, vehicle fleets, lighting, climate control, parking, security and more to improve visibility of assets while using automation and analytics to save cost.

Insight			
Align spatial design with learning goals, making sure spaces support multi-modal learning – using voice, touch and digital ink helps students retain information and generate ideas.	Appropriate and dynamic lighting can raise student achievement. Rooms that are too hot or have high CO2 levels discourage learning and student attendance.	Students and teachers need to feel safe for effective learning. Integrated security systems help prevent problems and support emergency workers in case of an incident.	Education systems face tightening budgets. IoT, the cloud and data analytics can help by automating asset and facilities management and providing efficiency insights.

Key components			
Maker spaces equipped with physical computing solutions like <b>Arduino</b> , <b>Adafruit</b> and micro:bit help students explore STEM subjects.  Interactive learning environments can be equipped with <b>Surface Hubs</b> to enable collaborative class work.  To enable students to learn the way they want and work alone or in groups, <b>Windows 10 devices</b> are highly flexible with support for <b>Windows Ink</b> and 3-D.  <b>Whiteboard</b> lets teachers create big screen interactive lessons with real-time sharing and collaboration via Class Notebook and Classroom.	<b>Microsoft Azure</b> cloud-based solutions can be used to monitor and automate heating and cooling, keeping classrooms comfortable and reducing energy bills.  This <b>case study of the Peirce School, Arlington</b> explains how one primary school used the <b>Microsoft Azure</b> cloud computing platform to speed climate control problem detection by 15%, reducing energy consumption and cost.	<b>Microsoft technologies</b> let you combine artificial intelligence, video, big data and IoT to manage building access, smart cameras, emergency notifications, anti-bullying and crisis prevention.  The <b>Physical safety and security eBook</b> explains a range of technologies that can improve physical security at educational institutions.  <b>Microsoft Azure</b> supports smart cameras, real-time video analytics and machine intelligence to identify concerning behavior and act quickly to manage threats.	<b>Microsoft Azure IoT Services</b> can make transport, parking, payments and communication more efficient. It can also help schools enable smarter buildings, saving at least 10% through better facilities management and energy efficiency.  The <b>Connected campus &amp; school experiences eBook</b> explores how educational institutions can leverage the potential of IoT and smart buildings to improve life at school.

## Take the next step

### 1. Get resources

For more information about the four building blocks of intelligent environments and to gain access to the components described and much more, please visit our website.

### 2. Request a workshop

For help building your own intelligent environment for learning, just ask. Microsoft's in-house experts and education transformation partners can get you started with workshops tailored to your team.

### 3. Set up an Education Transformation Agreement

You can partner long-term with Microsoft on your education organization's transformation strategy via an Education Transformation Agreement. Talk to your local account team to find out more.

Bannister, D. (2017) Guidelines on Exploring and Adapting Learning Spaces in Schools. European Schoolnet.  
Taylor, A. (2009) Linking Architecture and Education: Sustainable Design of Learning Environments. University of New Mexico Press  
Sleegers, P.J.C. et al. (2013) 'Lighting affects students' performance positively: findings from three Dutch studies'. Lighting Research Technology 45.  
Shenell et al. (2004) Associations between classroom CO2 concentrations and student attendance in Washington and Idaho'. Indoor Air, 14:5.  
Akiba, M. & Letendre, G. (2002) 'Student Victimization: National and School System Effects on School Violence in 37 Nations' American Educational Research Journal, December.

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