

# Surface in Education: Design and Implementation process

## How 1:1 is used in the classroom

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Technologies  
Professional Development



Microsoft in Education  
Microsoft Showcase Schools

BRIDGE THE GAP

What are OUR  
expectations for  
what technology  
makes possible for  
modern learners?





# Self-directed learning.

The screenshot displays the Physics Stack Exchange homepage. At the top, there is a navigation bar with links for 'log in', 'chat', 'meta', 'about', and 'faq', along with a search box. Below this is a header section with the 'PHYSICS' logo and navigation links for 'QUESTIONS', 'TAGS', 'USERS', 'BADGES', 'UNANSWERED', and 'ASK QUESTION'. A central banner explains the site's purpose: 'Physics Stack Exchange is a question and answer site for active researchers, academics and students of physics. It's 100% free, no registration required.' It includes a 'Tell me more' button and three icons illustrating the site's workflow: 'Anybody can ask a question', 'Anybody can answer', and 'The best answers are voted up and rise to the top'. Below the banner, the 'Top Questions' section is visible, featuring a list of questions with their respective statistics (votes, answers, views) and tags. The questions listed are: 'Young's double slit experiment viva question', 'Do small-angle coherent scattering experiments really see coherent effects over arbitrarily large distances?', 'Why electric field outside the sphere that carries polarization is 0?', and 'Flux Quanta in the Arahamov-Bohm effect'. On the right side, there is a '140 People Chatting' section with two chat windows: 'The h Bar' and 'Question/answer discussion'. At the bottom right, there is a 'StackExchange' logo.

StackExchange

log in chat meta about faq search

**PHYSICS**

QUESTIONS TAGS USERS BADGES UNANSWERED ASK QUESTION

Physics Stack Exchange is a question and answer site for active researchers, academics and students of physics. It's 100% free, no registration required.

[Tell me more](#)

**Here's how it works:**

- Anybody can ask a question
- Anybody can answer
- The best answers are voted up and rise to the top

**Top Questions** active 4 featured hot week month

votes	answers	views	question	tags	time ago	author	views
0	0	6	Young's double slit experiment viva question	optics visible-light double-slit-experiment diffraction	2m ago	Crazy Buddy	4,967
0	0	3	Do small-angle coherent scattering experiments really see coherent effects over arbitrarily large distances?	scattering neutrino neutron coherence	26m ago	Jess Riedel	126
0	0	6	Why electric field outside the sphere that carries polarization is 0?	electromagnetism electric-field polarization	28m ago	Bek	3
0	0	18	Flux Quanta in the Arahamov-Bohm effect	quantum-mechanics berry-pancharatnam-phase	30m ago	ramanujan_dirac	1,181

140 People Chatting

The h Bar  
9 hours ago - ManishEarth

Question/answer discussion.  
2 days ago - ManishEarth

StackExchange



A closer look at a modern learner in action...



# Our Modern Learners....

..are **Social Learners...**

They believe strongly in the value of relationships

..are **Self-directed**

They want to shape their own destiny

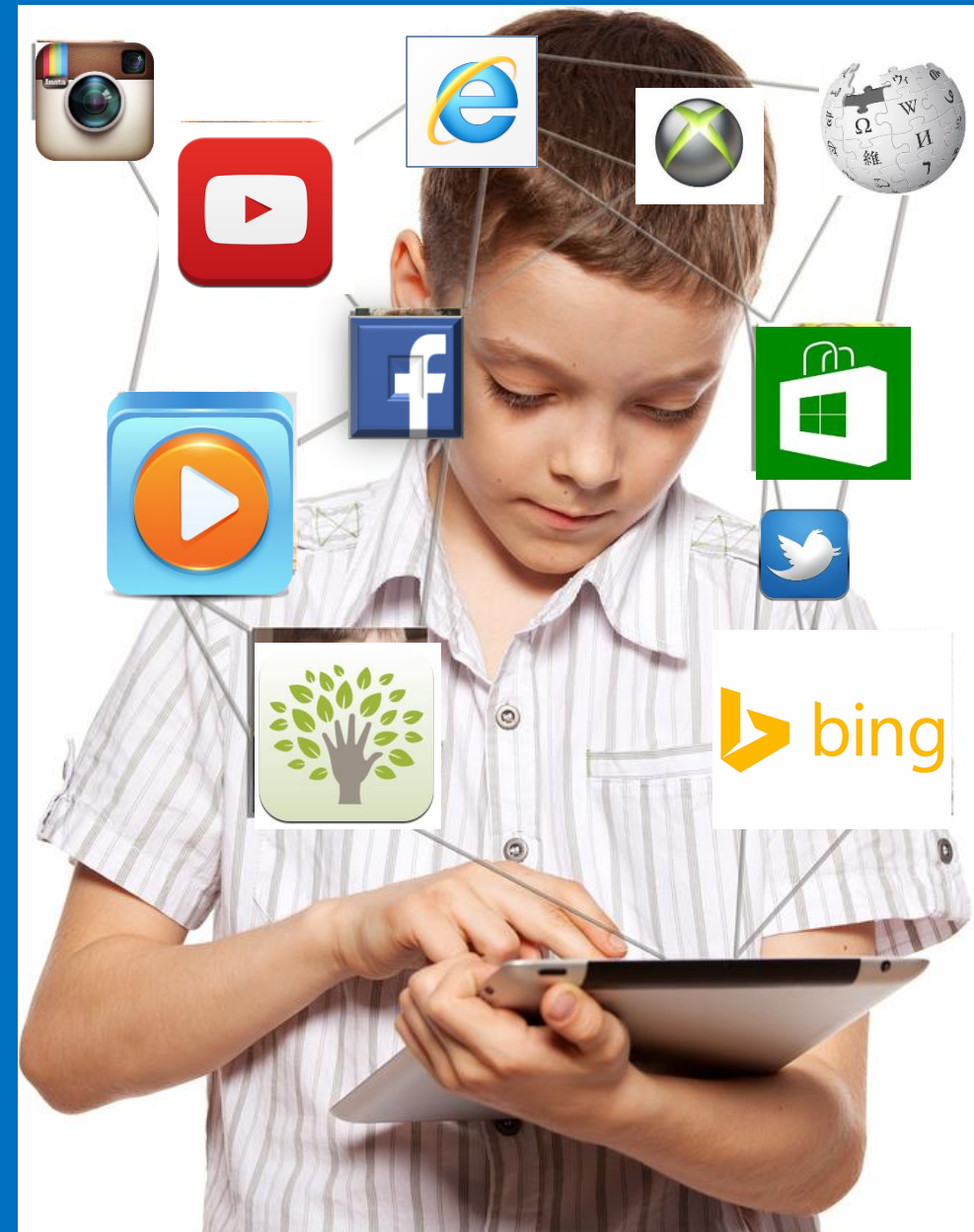
..and they are **Inquiry-based**

They are curious



Information today is...

Open  
Distributed  
Scalable  
Social  
Generative  
Networked  
Self-organized  
Adaptive  
Global





$\psi_0(x) = A e^{-\alpha|x|}$   
 $\int_{-\infty}^{\infty} \psi_0^*(x) \psi_0(x) dx = 1 \implies A^2 \int_{-\infty}^{\infty} e^{-2\alpha|x|} dx = 1$   
 $2A^2 \int_0^{\infty} e^{-2\alpha x} dx = 1 \implies 2A^2 \left( \frac{1}{2\alpha} \right) = 1 \implies A = \sqrt{\alpha}$

Hydrogen atom:  
 $K = \frac{(Z_1)(Z_2)e}{4\pi\epsilon_0 r}$   
 $\frac{N(\theta)}{N_i} = 32 \times 10^{-1} \text{ m}^{-2} = 32 \times 10^{-7} \text{ nm}^{-2}$   
 $v = c/450$   
 $\lambda = \frac{h}{p}$   
 $2\pi r = n\lambda = n \frac{h}{p}$   
 $L = rp = \frac{nh}{2\pi} = n\hbar$

Energy levels:  
 $E_n = -\frac{13.6 \text{ eV}}{n^2}$   
 $E_1 = -13.6 \text{ eV}$   
 $E_2 = -3.4 \text{ eV}$   
 $E_3 = -1.51 \text{ eV}$   
 $E_4 = -0.85 \text{ eV}$   
 $E_5 = -0.54 \text{ eV}$   
 $E_6 = -0.38 \text{ eV}$   
 $E_7 = -0.28 \text{ eV}$   
 $E_8 = -0.20 \text{ eV}$   
 $E_9 = -0.15 \text{ eV}$   
 $E_{10} = -0.11 \text{ eV}$

Wave functions:  
 $\psi_{100}(r) = \frac{1}{\sqrt{\pi}} \left( \frac{1}{a_0} \right)^{3/2} e^{-r/a_0}$   
 $\psi_{200}(r) = \frac{1}{\sqrt{4\pi}} \left( \frac{1}{2a_0} \right)^{3/2} (2 - r/a_0) e^{-r/2a_0}$   
 $\psi_{210}(r) = \frac{1}{\sqrt{4\pi}} \left( \frac{1}{2a_0} \right)^{3/2} \frac{r}{a_0} \cos\theta e^{-r/2a_0}$

Probability density:  
 $P(r) = 4\pi r^2 |\psi(r)|^2$   
 $P(r) = \frac{4}{a_0^3} r^2 e^{-2r/a_0}$   
 $\frac{dP}{dr} = \frac{8}{a_0^3} r (1 - r/a_0) e^{-2r/a_0}$   
 $\frac{dP}{dr} = 0 \implies r = a_0$

Uncertainty principle:  
 $\Delta p \Delta x \geq \frac{\hbar}{2}$   
 $\Delta E \Delta t \geq \frac{\hbar}{2}$

Schrödinger equation:  
 $\nabla^2 \psi + k^2 \psi = 0$   
 $\nabla^2 \psi + \frac{2m(E - V)}{\hbar^2} \psi = 0$

Other notes:  
 $\psi(r, \theta, \phi) = R(r) Y(\theta, \phi)$   
 $\psi(r, \theta, \phi) = \frac{1}{\sqrt{\pi}} \left( \frac{1}{a_0} \right)^{3/2} e^{-r/a_0}$   
 $\psi(r, \theta, \phi) = \frac{1}{\sqrt{4\pi}} \left( \frac{1}{2a_0} \right)^{3/2} (2 - r/a_0) e^{-r/2a_0}$   
 $\psi(r, \theta, \phi) = \frac{1}{\sqrt{4\pi}} \left( \frac{1}{2a_0} \right)^{3/2} \frac{r}{a_0} \cos\theta e^{-r/2a_0}$

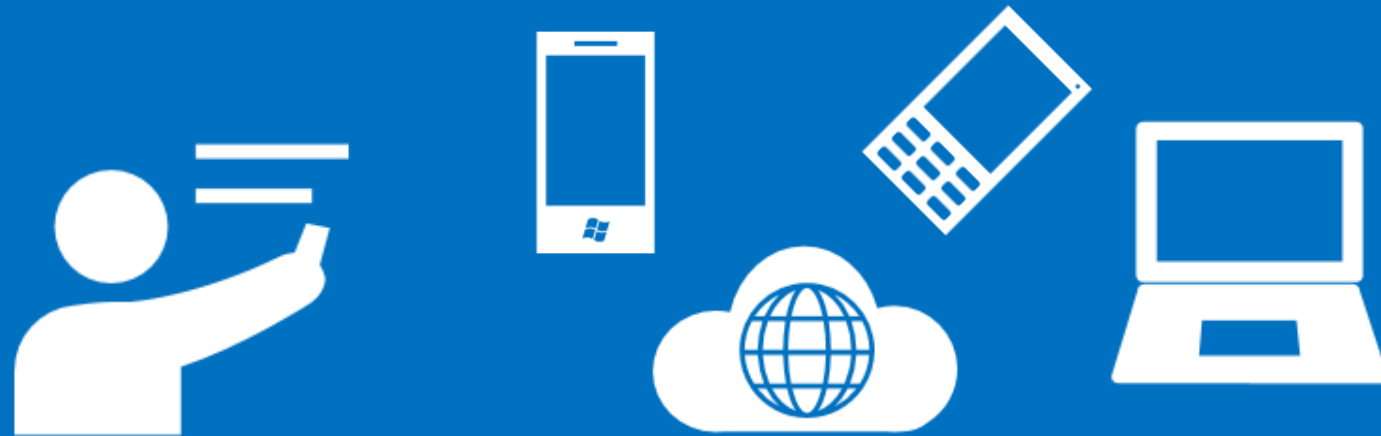




Are we locking our students  
potential up inside our  
20<sup>th</sup> Century concepts of  
curriculum?

What  
How  
Where  
When

students  
are learning is changing



# Statistics on 21 Century Students Framework

81% of teachers believe tablets enrich classroom learning

1:5 students have used a mobile app to keep their coursework organized.

86% of students believe that they study more efficiently with tablets.

59% of students would like to use their mobile device to enhance learning.

6 in 10 students use digital textbooks ( e-textbook market increase 25%)

32% of teachers use social media for coursework.





Provide Innovative Education



Supporting our Teachers



Inspiring our Students



Empowering our School



A shared learning space



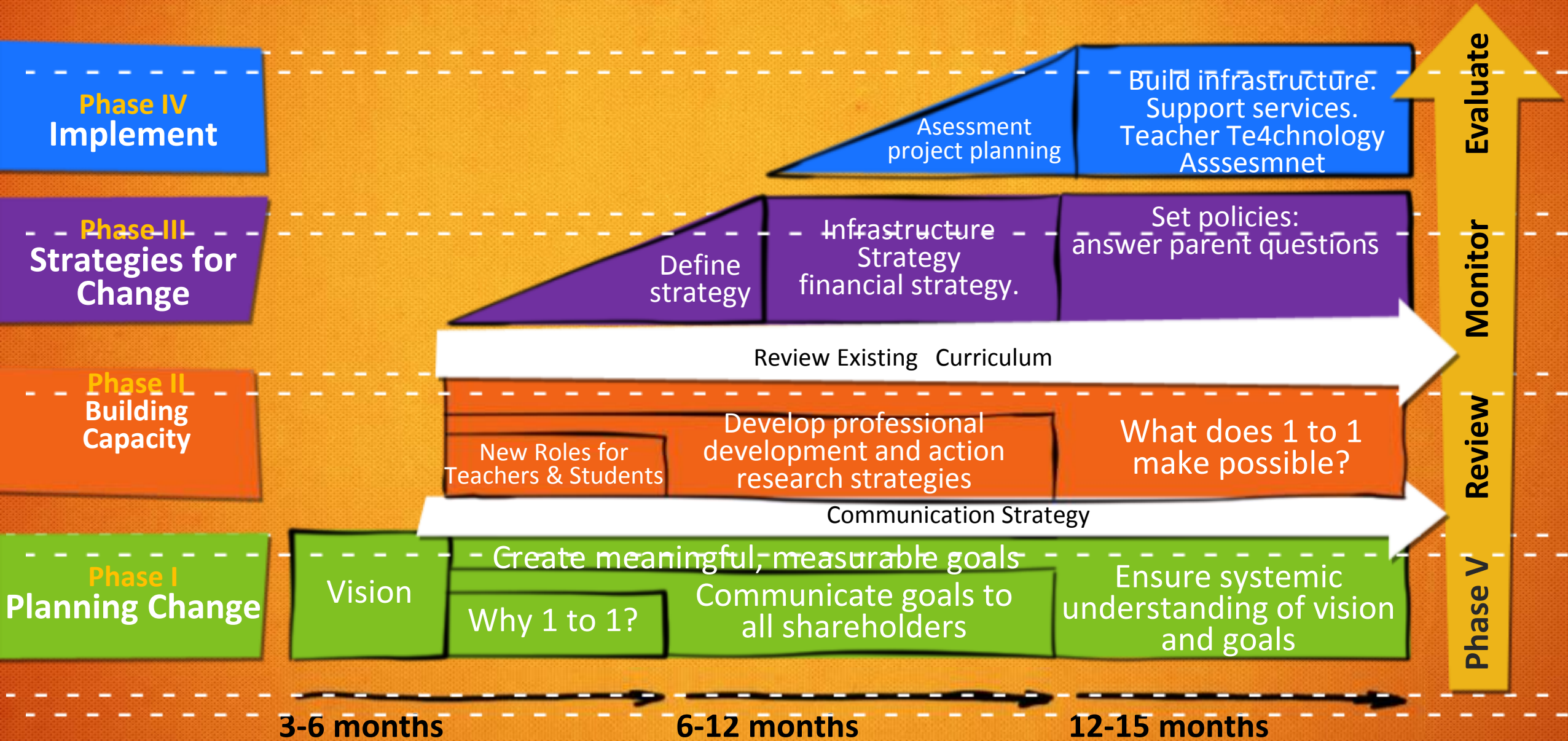
1:1 Microsoft Surface Tablet Initiative Program



# Design and Implementation Phases of 1:1 Microsoft Surface Tablet



# Design & Implementation Phases





# PHASE I Planning Change

Create  
objectives

Clarify Goals,  
Expectations,  
and Policy  
Priorities

Define VISION

Why 1 to 1?



# VISION



1. 21st Century Learning (collaboration, creation, communication)
2. Future economic growth
3. Personalized learning for our students
4. Learning beyond school
5. Expand pedagogical opportunities
6. Self-directed learners



# Objectives



- Use Tablet Surface as a tool, not as a means by itself.
- Teach more creatively and more collaboratively.
- Provide a solid digital literacy to our students.
- Students take responsibility for their own learning



# PHASE II Building Capacity

Create  
Action  
Research  
Strategy

Develop  
Professional  
development

Define Student  
Teacher  
Roles

What does 1 to 1  
Make possible ?





- Ensure teaching professional development is ongoing
- Established online learning communities
- Provide Technology training , workshops.
- Provide support for individual departments' needs



Operation  
Care and  
maintenance  
of the tablets

Managing  
files

Classroom  
tools such as  
website

Online safety  
awareness



# Review Existing Curriculum

To meet the 1:1 Tablet use in the classroom.  
Assign a teacher mentor  
Model several lessons with student examples.  
Teacher exchange ideas with other teachers.  
40% instructional period to be used with the tablet

# PHASE III Strategies Change

Define  
Strategy

Infrastructure &  
Financial  
Strategy

Involve  
Parents

Set Policies





# Microsoft Surface Tablet RT

Operating System: Microsoft Windows RT

Processor: NVIDIA Tegra 3

Memory: 2GB RAM

Flash Memory: 32 GB Integrated

Screen: 10.6 in, Color TFT active matrix Touch Display

Resolution: 1366 x 768

Keyboard: Detachable keyboard

Battery: 31.5 Wh 8Hours

Bluetooth: Bluetooth 4.0,  
802.11 a/b/g/n

Cameras and A/V: Two 720p HD LifeCams, front- and rear-facing. Two microphones, Stereo speakers

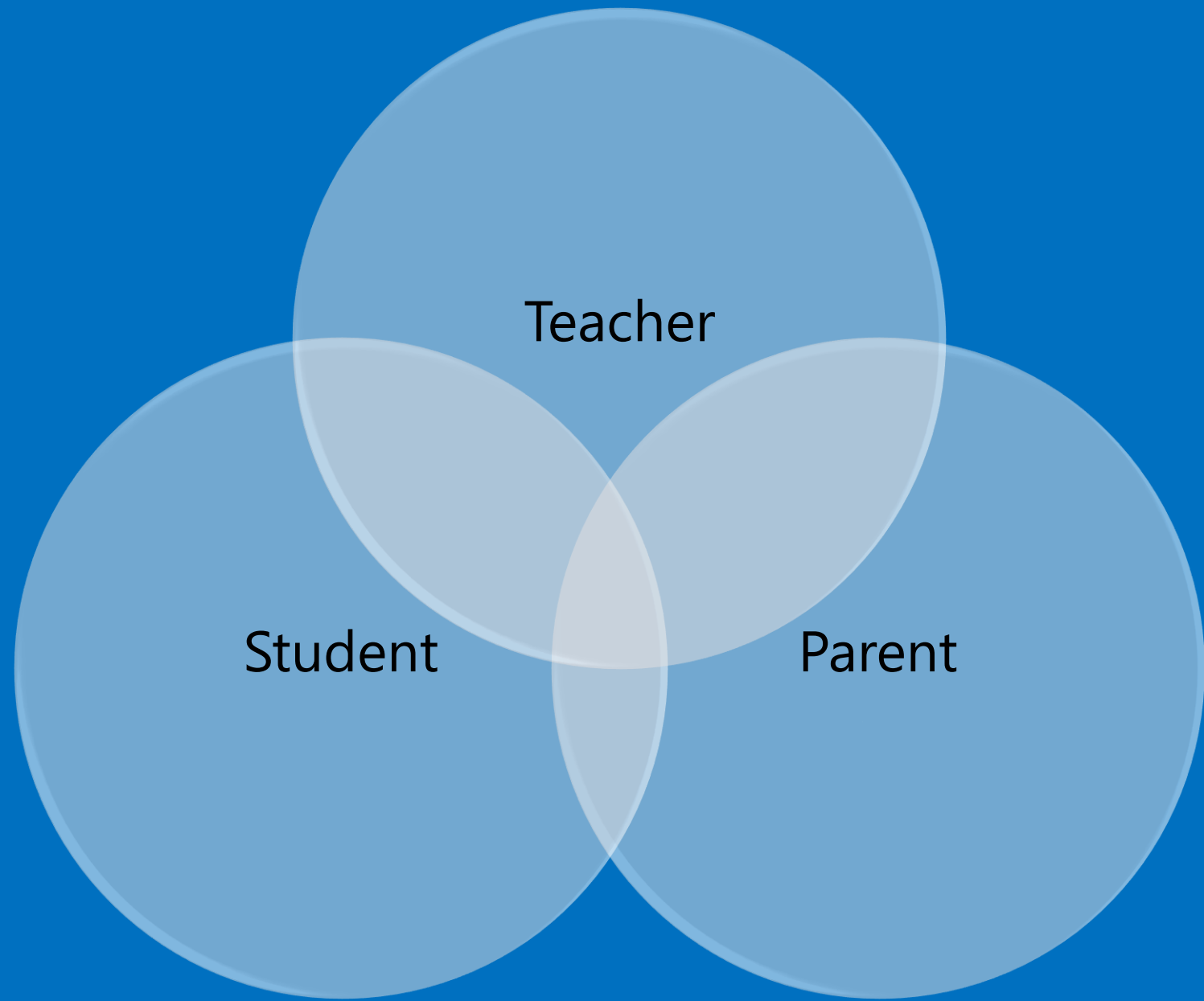
Ports: Full-size USB 2.0, microSDXC card slot, Headset jack, HD video out port, Cover port

Limited Warranty: 2-Year Warranty Stephanis





# The evolution of the 1:1 learning environment...



# Technology Infrastructure

Wireless  
Connectivity

IT Help Desk

Device  
Management  
Software



# School Safety Guidelines

- Firewall security on the network
- Antivirus
- Activity Report
- Restriction Report
- App Restrictions
- Requests from Help Desk



# Privacy and Security



# Parents Deliverables

Parents sign the Tablet  
Contract Agreement.

Use of Technology Resource  
School Policy.

Help Desk contact info.



Providing  
Innovative  
Education

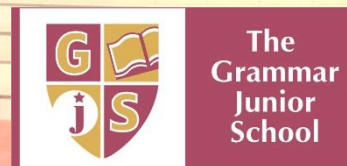
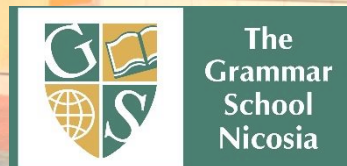
Empowering  
our School

Supporting our Teachers

Inspiring our Students



Technology is a catalyst for students to enrich their productiveness to enhance collaboration and take control of their own learning



# Innovative Lessons



Reorganization

Blended Learning

Interactivity



Information Gathered

Uploading

Research



Collaboration



Video Recorder

Processing

Critical Thinking

Problem Solving

Explain New Knowledge





# FUNecole<sup>®</sup>

## Class 1 and Class 2

FUNecole<sup>®</sup> supports pupils to behave, perform act under challenging conditions and striving towards...

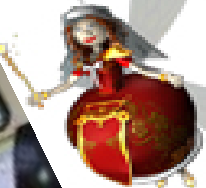
- ☀ Strategic reasoning,
- ☀ Perseverance,
- ☀ Insightfulness,
- ☀ Creativity...



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Open your minds:  
Let's start learning.



The Grammar Junior School

# THE INVERSION

## The Traditional Classroom

Teacher's Role: Sage on the Stage



## The Flipped Classroom

Teacher's Role: Guide on the Side



# WHAT A FLIPPED CLASSROOM MODEL DOES