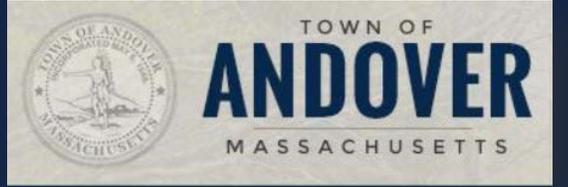




THOUGHTS ON WEST ELEMENTARY TECHNOLOGY

Paul J. Puzanghera
Chief Information Officer
14 May 2020

AGENDA

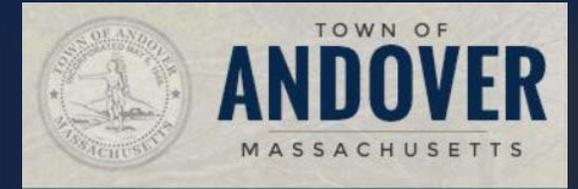


- Who is IT? What do we do?
 - Mission
- How does our network work?
- Our Model Classroom
 - Now
 - Soon
- Preparing for the future – how well does our physical design support our teaching models?

WHO IS **IT**?



WHAT DOES **IT** DO?



What do we do?

- Responsible for both school and municipal technology
 - One non-IT resource exists at Library
- All aspects of network: switching, wireless, wiring, firewall, security, fiber network
- All servers and storage platforms. Email and software platforms
- All voice communications (600+)
- All staff end user devices (\approx 1200) All procurement and configuration
- All student/lab end user devices (\approx 4000)
- Printers (1000+)
- Customer service/help desk calls (5000+/year)
- All Enterprise applications. Many department applications
- Geographic Information (GIS)
- Web sites
- Interactive projectors, audio enhancement, video conferencing, etc.

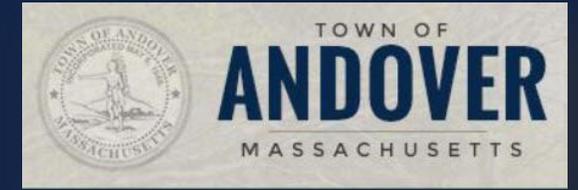
What don't we do?

- Security cameras, HVAC, access control, lighting
- The Digital Learning team supports the teacher's efforts in the classrooms
- There is "shadow" IT everywhere
- What should we do more of?
 - More data analysis, data warehousing, performance management
 - More business process management
 - More procurement and project management

IT was born out of the merger of 4 separate technology teams beginning in 2012. Andover became one of the first towns with a unified IT function led by a CIO.

In 2014 Town Meeting passed a \$2.5M bond issue to completely revamp the town technology function.

ANDOVER TECHNOLOGY – THEN AND NOW



Then

- 4 distinct networks, 4 sets of email servers, 4 sets of backup and so forth
- No client device newer than 8 years
- Several hundred lab based desktop PCs across all schools
- Devices funded by unpredictable capital requests
- No wireless
- 8 year old SMARTBoards in a smattering of rooms
- Expensive 1970's Centrex phone technology
- Less than 1000 devices on the network
- 50mbps Internet for Town and Schools
- Nearly 100 standalone servers with individual storage
- All town finances running on 25 year old DEC Alpha
- Technicians servicing 1000 staff and 1,000 devices

Now

- All networks unified, common email, backup, archiving etc.
- No client device more than 5 years old
- All 6200 students have a mobile device 24x7. Half are BYOD at no cost to town
- Devices funded by predictable annual leasing costs
- Wireless in all 23 buildings
- Low cost Epson interactive projectors in all classrooms and meeting spaces
- New Voice over IP (VoIP) system reduces costs by 50%+
- 20,000+ devices on our network daily
- 2gbps Internet (40x increase)
- Centralized virtual server and storage network (SAN) replaces all individual machines
- Alpha decommissioned and all functions migrated to MUNIS
- Technicians servicing 7500 staff and students and 10,000 devices

IT PROJECT DASHBOARD

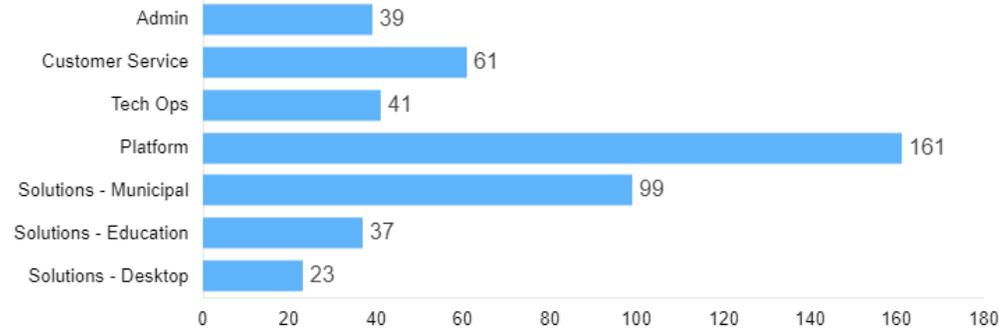


Total Projects
433

Project Planning Dashboard

Active Projects
62

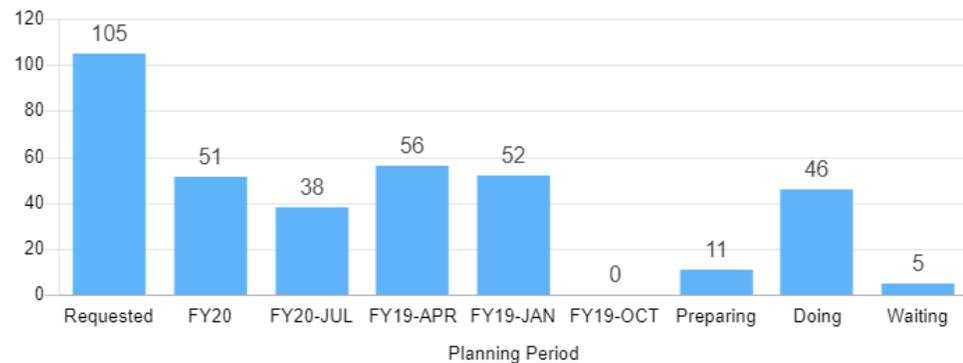
Projects by Team



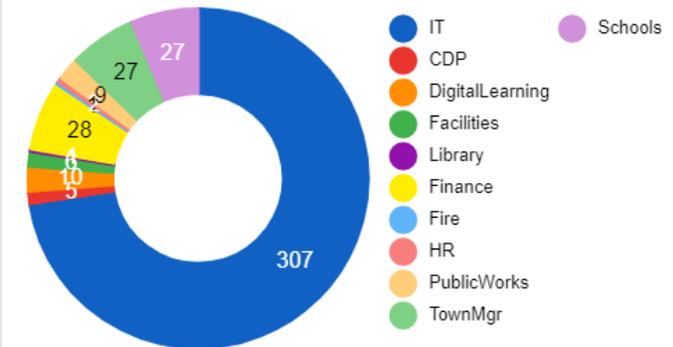
IT Goals and Objectives

- *Improve Citizen Engagement and Experience*
- *Improve Student Learning*
- *Improve Staff Productivity and Collaboration*
- *Improve Operational and Economic Efficiency*
- *Ensure Safety and Security*
- *Create a Measurement Culture*
- *Support TM and Department Initiatives*
- *Enhance and Maintain our Technology Platforms*
- *Enhance and Maintain our Application Platforms*
- *Provide Outstanding Customer Service*

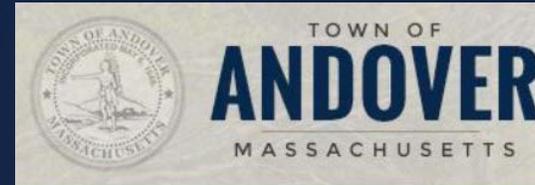
Projects by Planned Date



Projects by Sponsor



IT MISSION

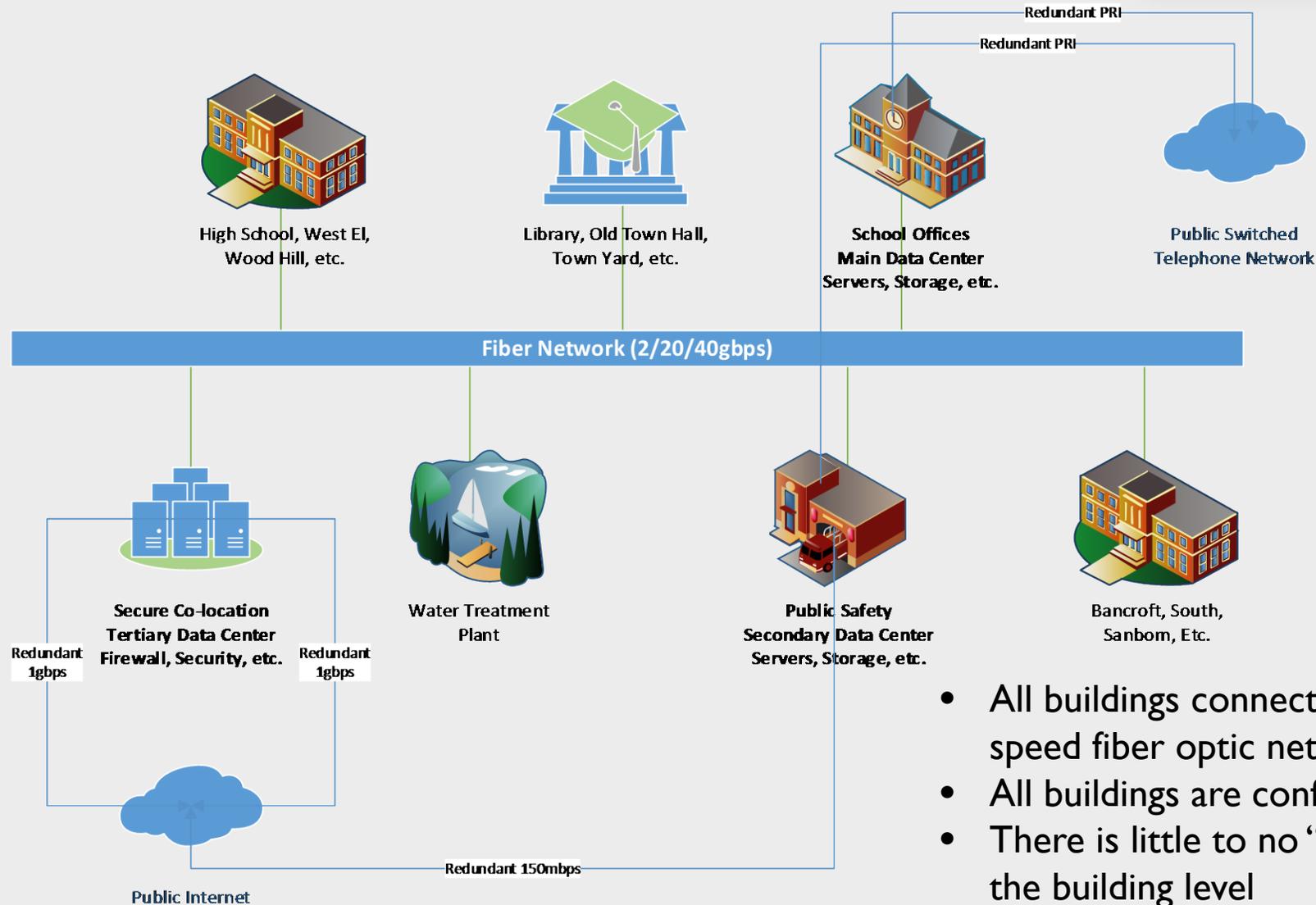
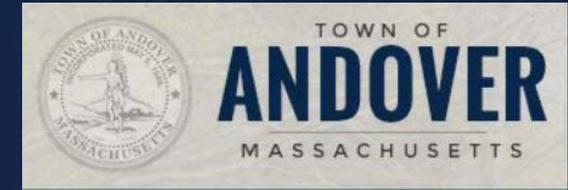


- Improve Citizen Engagement and Experience
- Improve Student Learning
- Improve Staff Productivity and Collaboration
- Ensure Safety and Security
- Improve Operational and Economic Efficiency
- Create a Measurement Culture
- Support TM and Department Initiatives
- Enhance and Maintain our Technology Platforms
- Enhance and Maintain our Application Platforms
- Provide Outstanding Customer Service

WHAT DOES OUR TECHNOLOGY LOOK LIKE
TODAY?



OUR NETWORK AND DATA CENTERS



- All buildings connected by a single high speed fiber optic network
- All buildings are configured identically
- There is little to no “intelligence” at the building level

OUR MODEL CLASSROOM



Security Cameras



Printer/
Scanner

Wireless Intercom System



Access Control



Handset



Digital Speakers



Panic Buttons



Hybrid Windows



Sound Amplification
Assistive Hearing



Access Points



Camera



Interactive Projectors



Charging Station



Hybrid
Chromebook



Document Microphone
Camera



MODEL CLASSROOM FEATURES



Current Features

- Currently deployed in classroom ...
 - Hybrid laptop/tablet portable devices for teachers and students
 - Storage and charging
 - Full wireless connectivity
 - Interactive projectors with wireless connectivity for teachers and students
 - Teacher amplification and assistive hearing
 - Telephony handset
- Currently deployed in building
 - Security cameras
 - Access control
 - Heating and lighting control
- Current planned standard ...
 - Combined speaker/flasher/clock with “panic” buttons
 - Document camera
 - Shared high capacity printer

Future Considerations

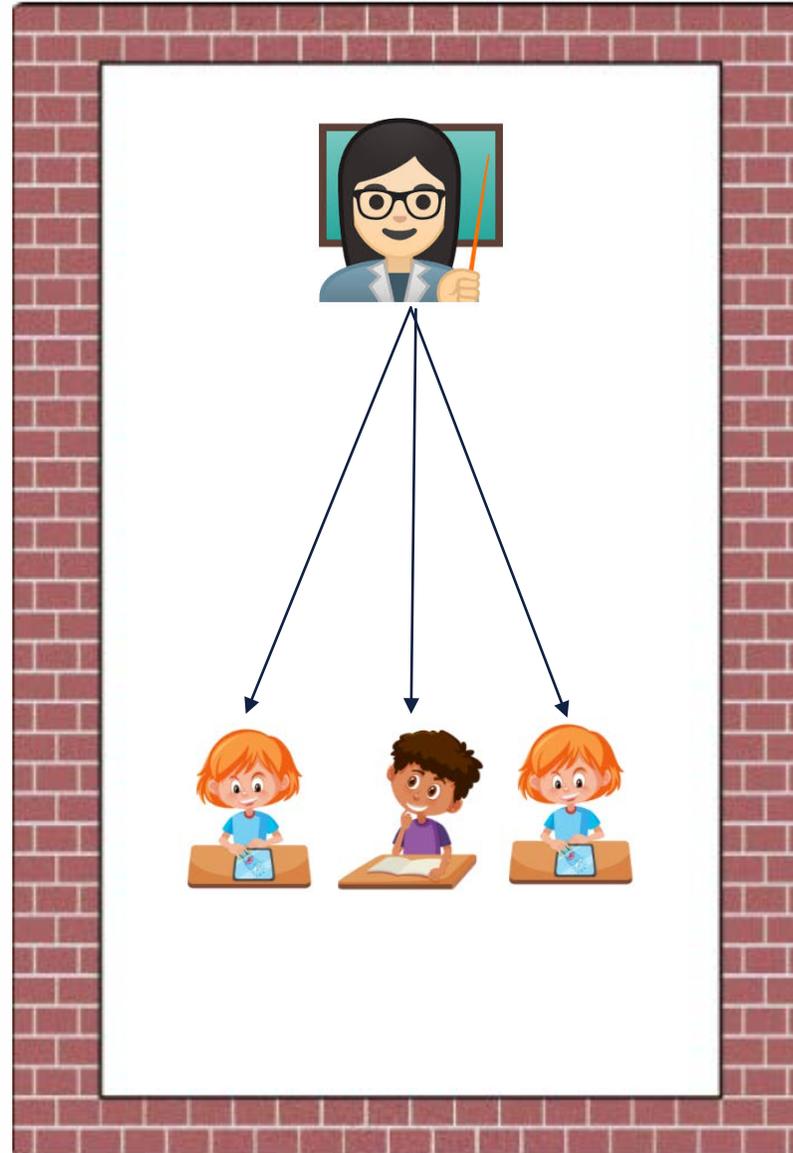
- Video capture for teacher presentations
 - Video capture of students is more controversial
- Collaborative projection capabilities for small teams
 - Projectors vs fixed display devices
- Smart door locks. Automated doors/zones
- Smart lighting
 - Lighting over PoE/CAT6
- Smart sun control
- Smart thermostats
- Alexa type voice control
- Offensive security capability
- Robot teachers, chatbots
- Internet of things (IoT)
- Facial recognition



HOW WELL WILL THE BUILDING DESIGN SUPPORT
ALTERNATIVE TEACHING MODELS?



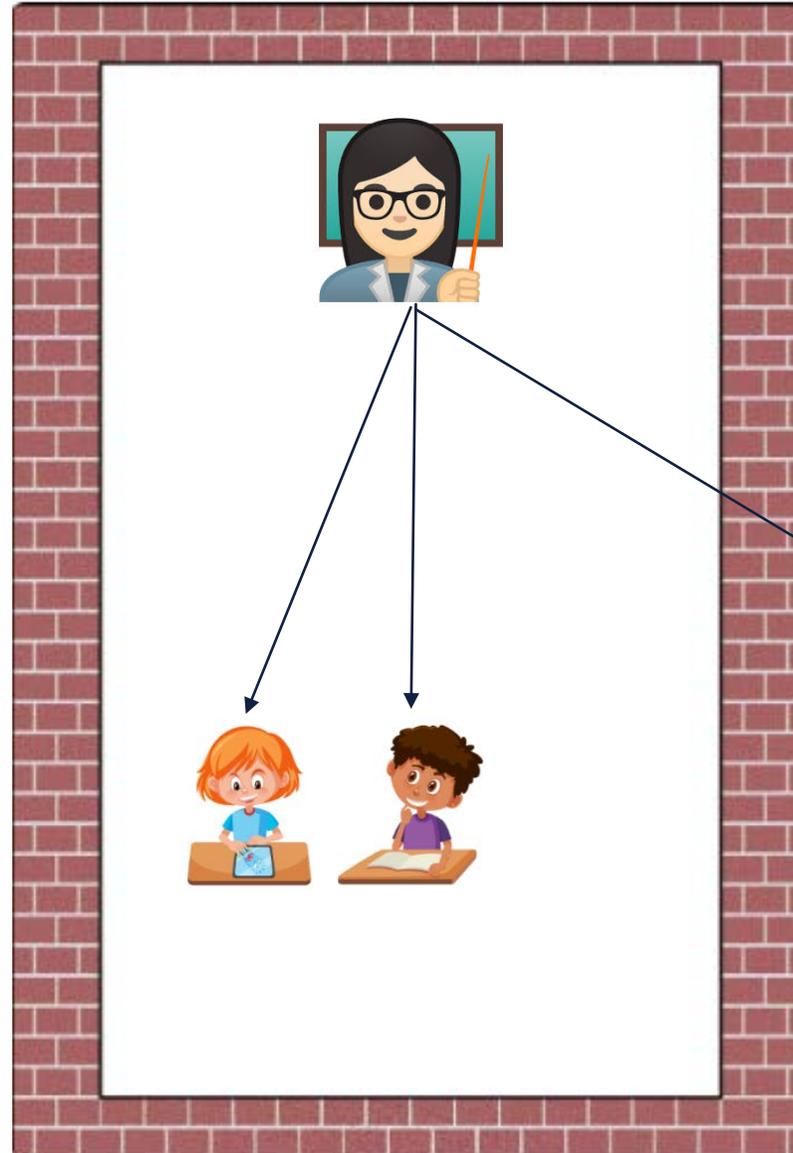
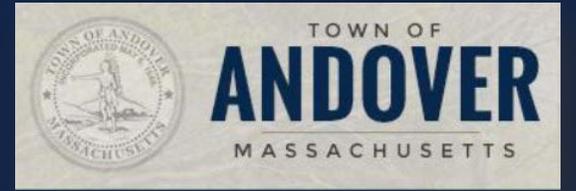
THE TRADITIONAL MODEL



Teacher and students all in one
physical classroom
Everyone learning the same
thing

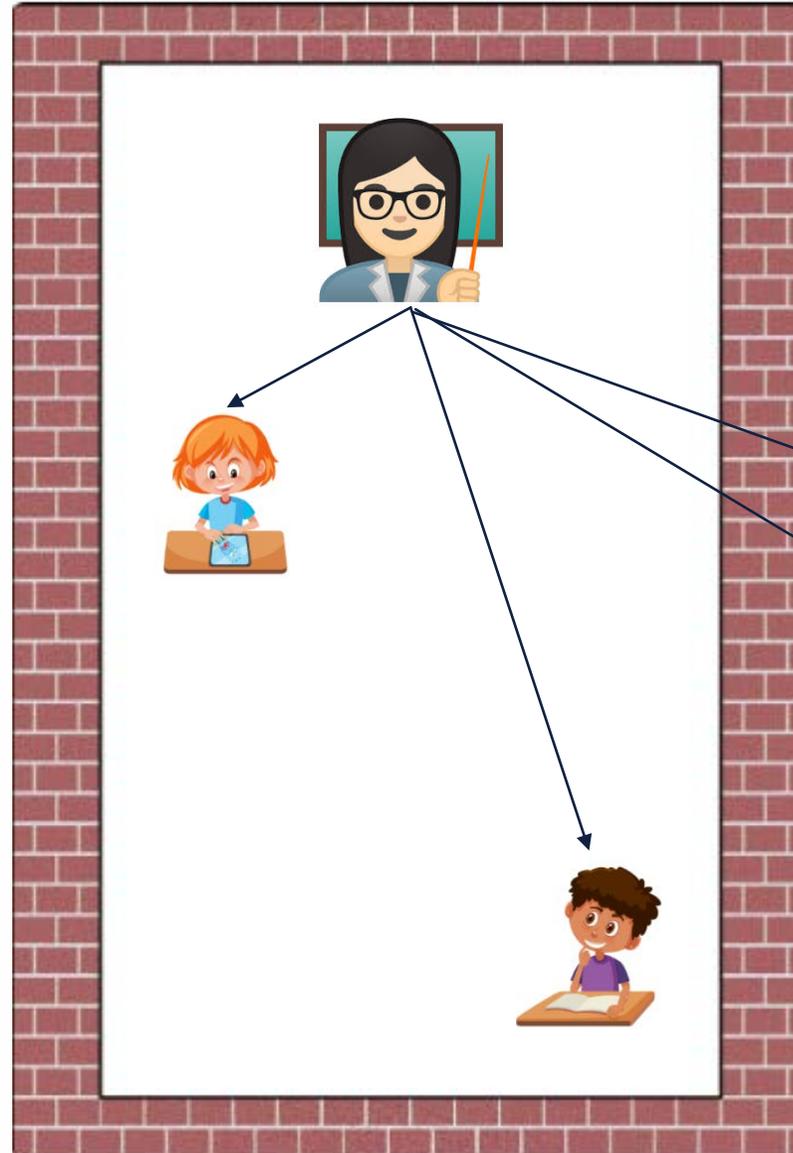
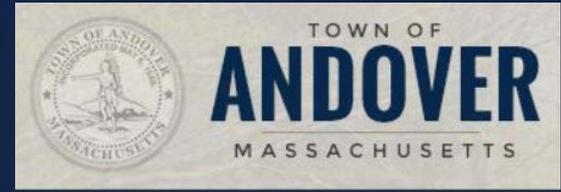
“The Sage on the Stage”

NOT EVERYONE IN CLASSROOM



Children home with illness?
Home schooling?
Everyone learning the same
thing

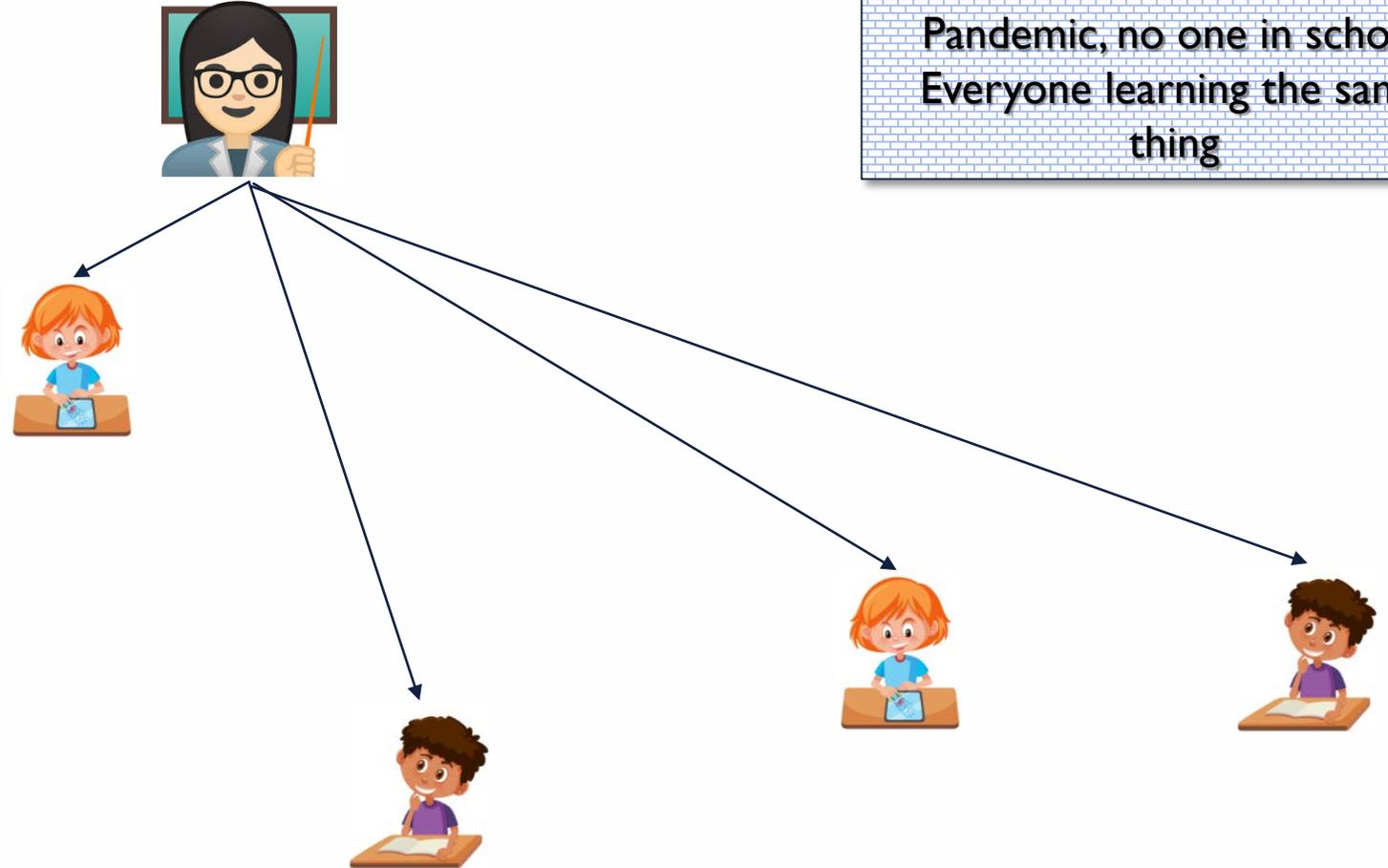
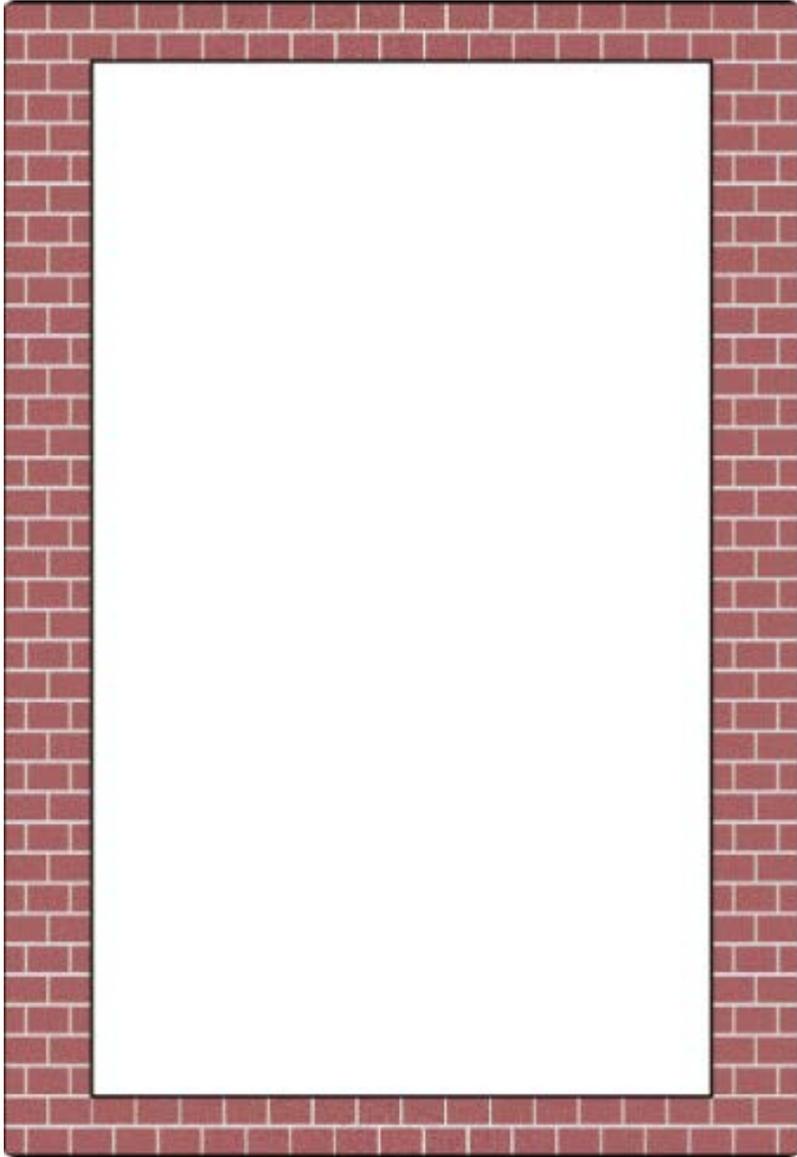
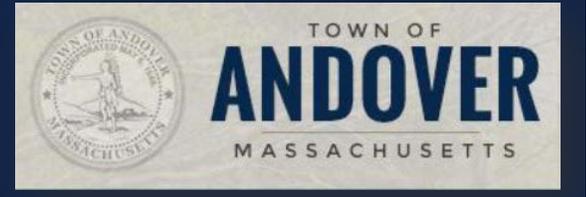
SOCIAL DISTANCING



Half home/half in school
Everyone learning the same
thing

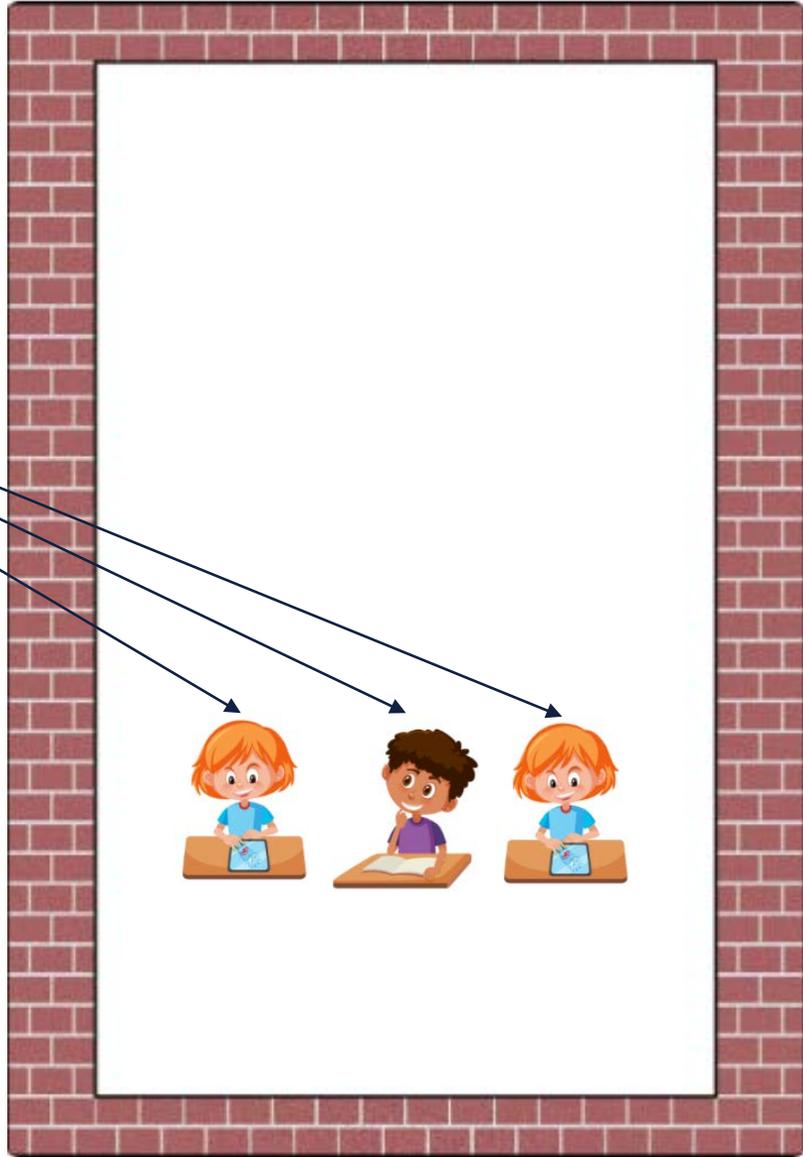
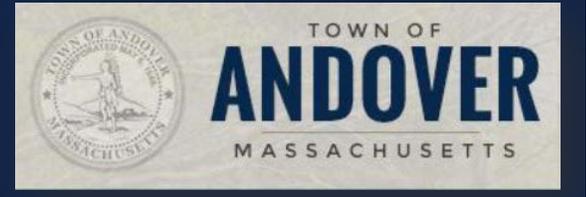


PANDEMIC – NOBODY IN CLASSROOM



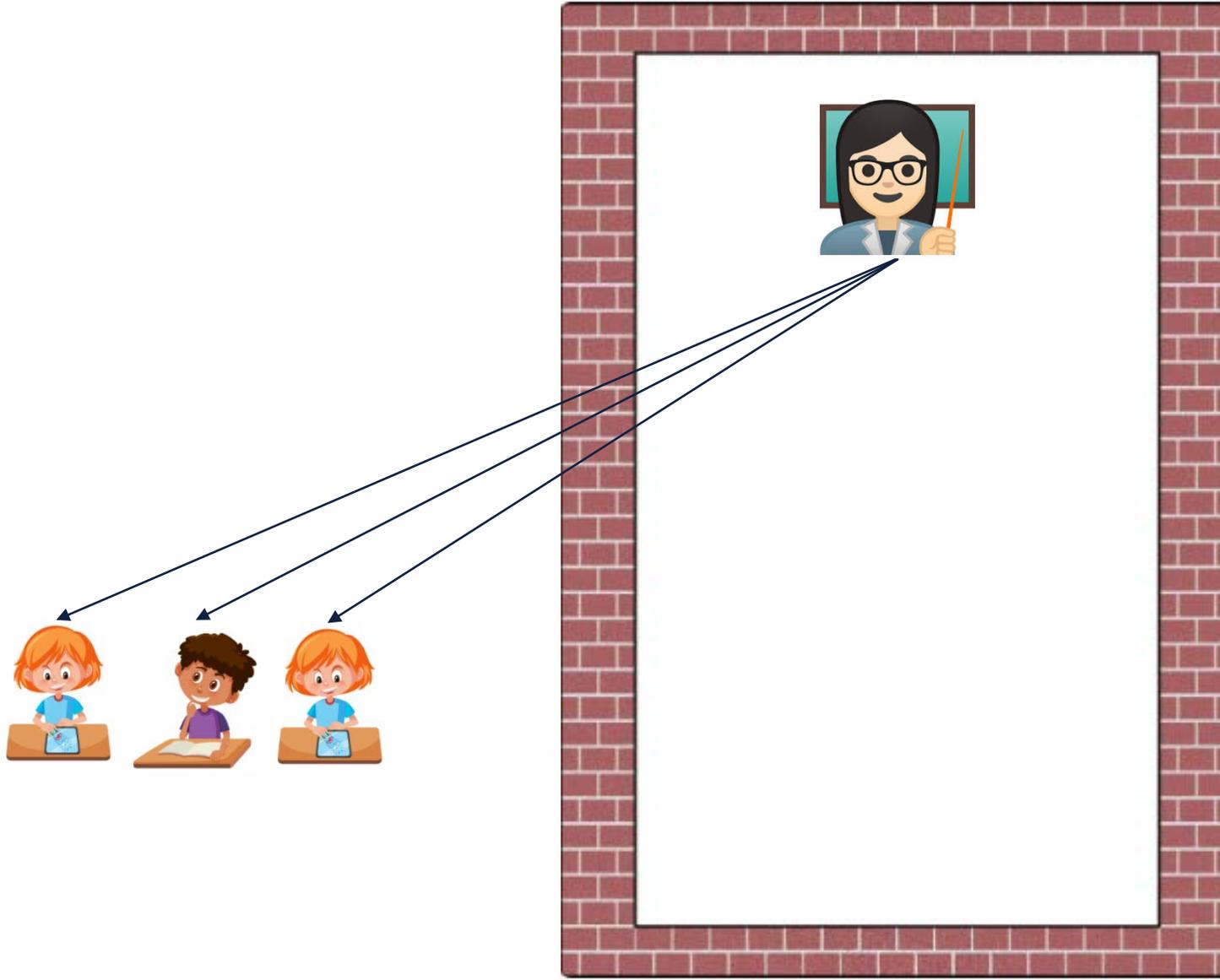
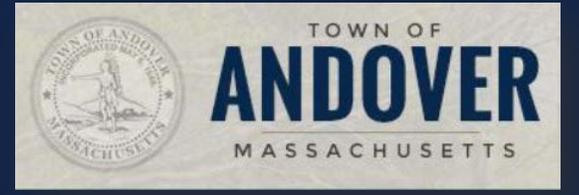
Pandemic, no one in school
Everyone learning the same
thing

VIRTUAL TEACHER



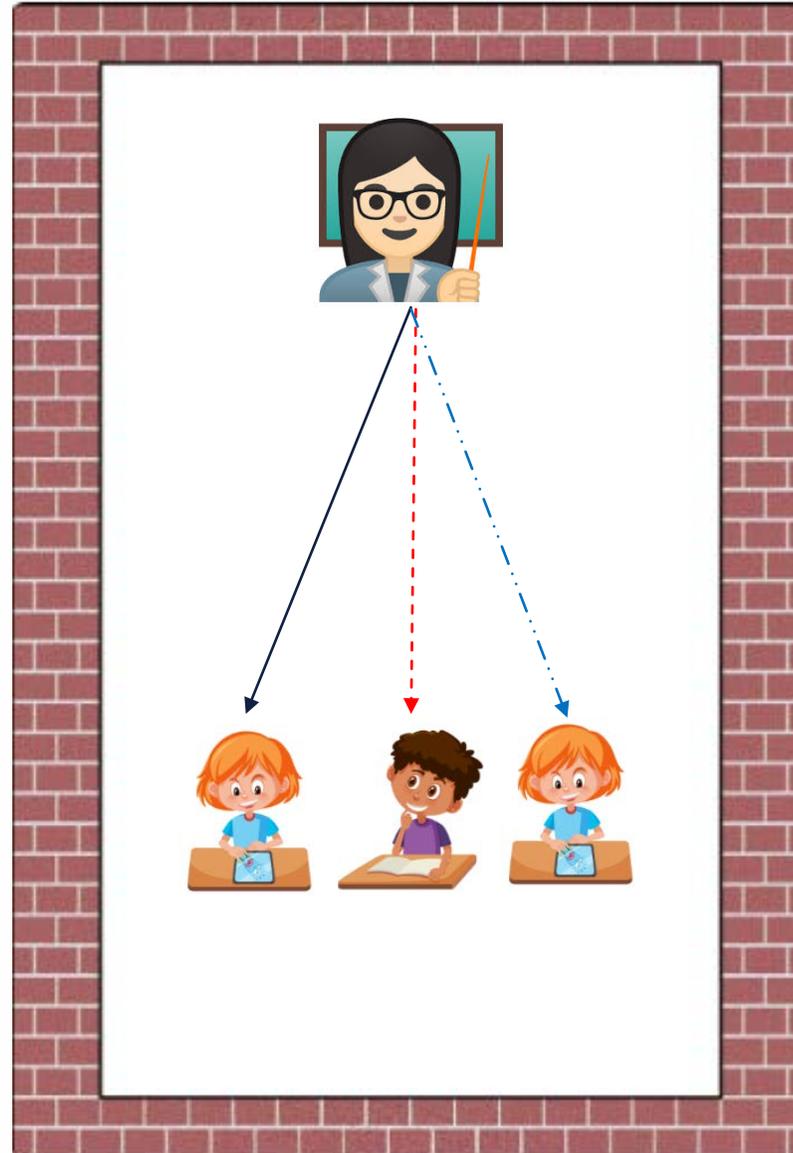
Virtual teacher from another district or country
Everyone learning the same thing

OUR TEACHERS ARE TEACHING ELSEWHERE



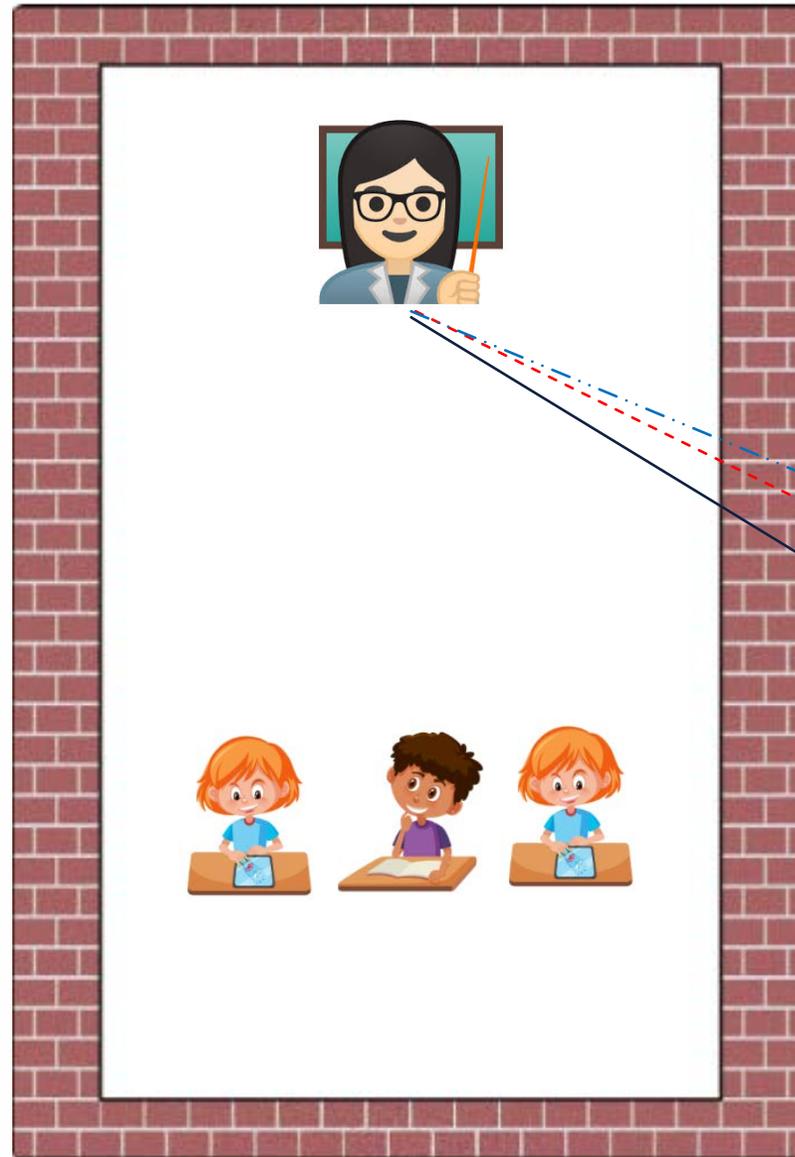
We “project” our teaching power to other towns or countries
Everyone learning the same thing

BLENDED OR PERSONALIZED LEARNING



Teacher and students all in one
physical classroom
Everyone learning something
different

FLIPPED CLASSROOM



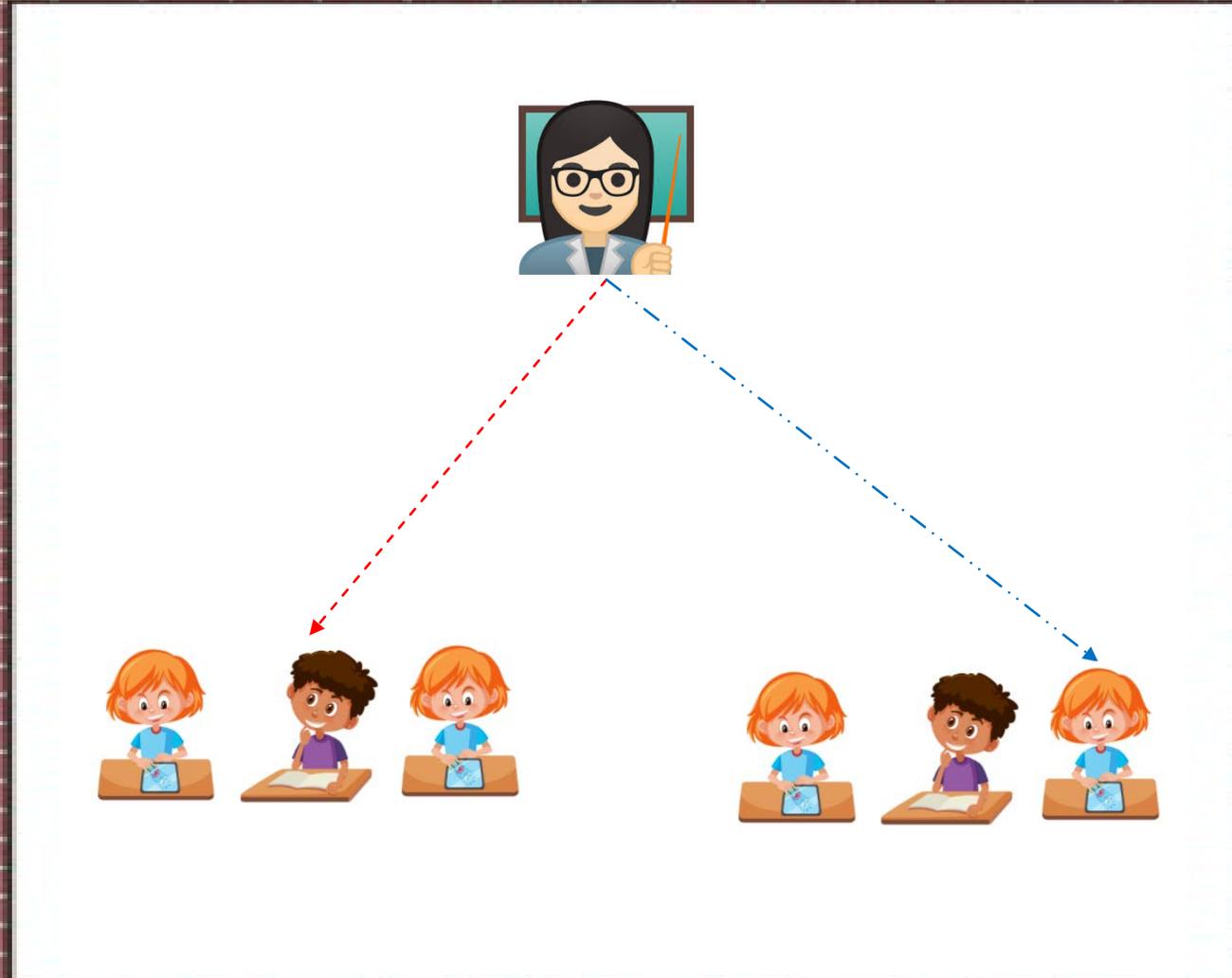
Teacher and students do virtual at home and physical instruction
Everyone learning at a different pace



TEAM INSTRUCTION

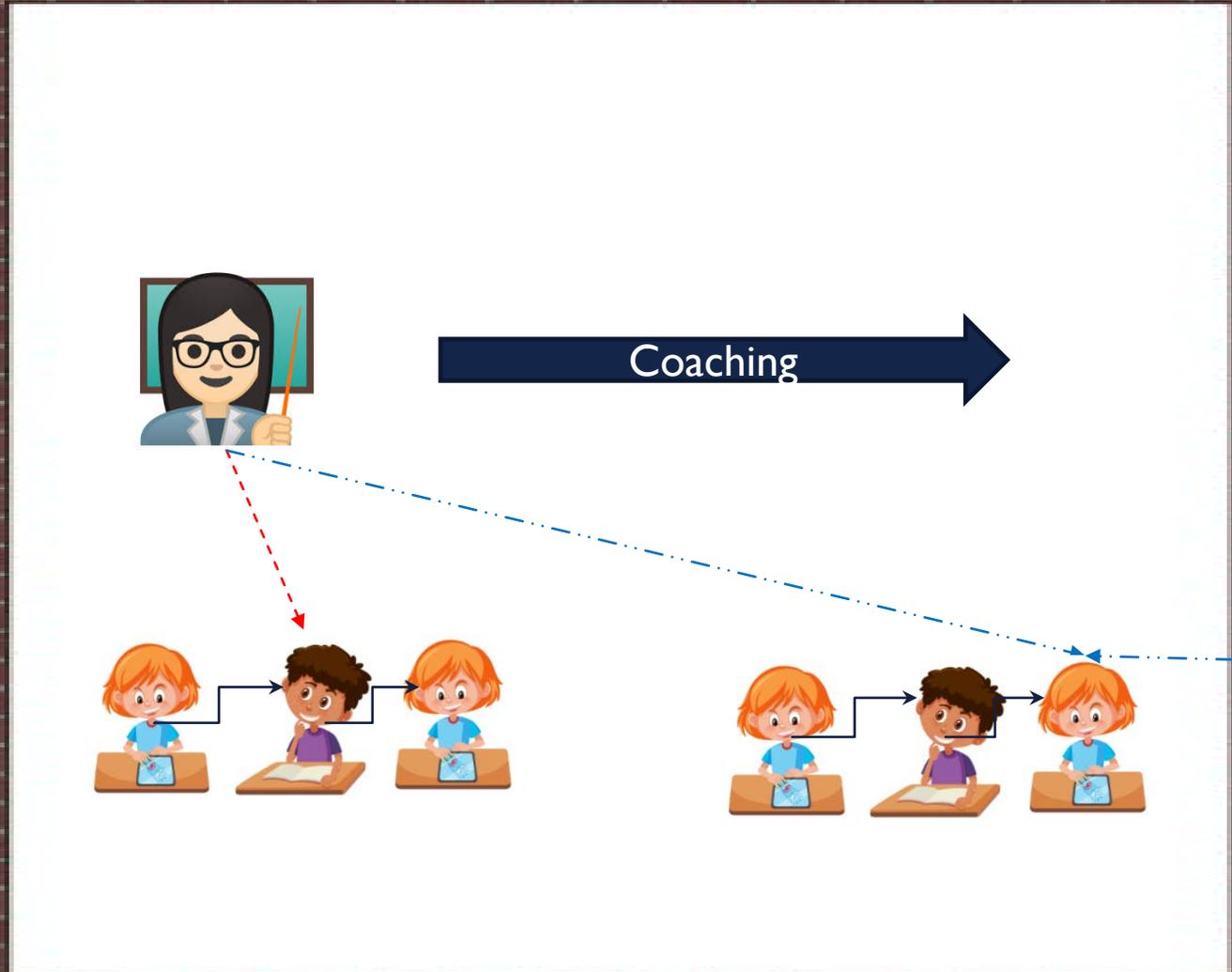
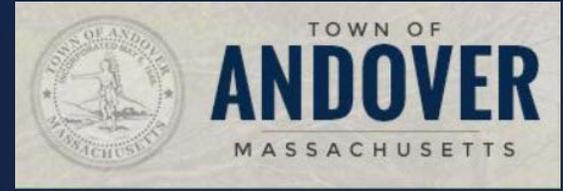


TOWN OF
ANDOVER
MASSACHUSETTS



Students are organized into teams, teacher organizes instruction
Each team learning at different pace

STUDENT GUIDED INSTRUCTION



Students are personalizing and self organizing own learning
Teacher is more "coach"
Each team learning at different pace
Lots of content comes from 3rd parties





SCHOOLS NEED
TO BECOME THE
HUB OF NEW
VIRTUAL
LEARNING
COMMUNITIES

CAN THESE MODELS
DELIVER EDUCATION
AT A LOWER COST?

QUESTIONS? THOUGHTS?





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