Individual Web
- Use a web server to build an individual student environment per Pocket PC

Pocket Internet Explorer
- 229 x 255 screen
- Large font
- Limited area
- Limited tools
- No address bar
- No zoom

Web Server
Student 1 10:32:01
Student 2 10:32:05
Student 10 10:32:15
Student 6 10:32:16
Individual Web

- Use a web server to build an individual student environment
- Each student is identified and their interaction is logged
- Groups of students can also be monitored

Real-time Assessment

- Build exercise on web basis
- Monitor student activity/answers in real-time
- Monitor individual
  - Answers
  - Progress
- Monitor group
  - Answers
  - Progress

Traditional Mineral ID Exercise

- Students are introduced to physical tests/making observations
- Students are given flow charts/identification charts
- Students perform exercises on samples
- Exam is based on correct identification of new samples

Student View (Student Voice)

- Pick a mineral from the list
- Make observations to fit the properties on the identification chart

  "Get an answer then explain it."

A New Approach

- Students are given a suite of samples.
  - Same order of samples
  - Five groups

Web Server

Student 1 10:32:01
Student 2 10:32:05
Student 10 10:33:15
Student 6 10:32:16

Groups:
- Group A
- Group B
- Group C
- Group D
- Group E
A New Approach

- Students are given a suite of samples.
- Individual web exercise leads them through physical tests/observations

Example

- Students apply a test or make observations over all specimens.
- Student answers browser question.
- Student submits answer.

Luster Flow Chart

```
Yes  Metallic?
    No

Yes  Opalescent?
    No

Yes  Vitreous?
    No
```

Sequence of Tests/Observations

- Luster
- Hardness
  - Against common items (fingernail, nail, etc)
  - Hardness against Calcite or Quartz
- Cleavage/Fracture
- Color
- Streak

A New Approach

- Students are given a suite of samples.
- Individual web exercise leads them through physical tests/observations
- Monitor progress via real-time assessment

Student Monitor

Each student is monitored for:
- Correctness
- Timeliness
A New Approach

- Students are given a suite of samples.
- Individual web exercise leads them through physical tests/observations
- Monitor progress via real-time assessment
- After all of the physical tests, then identify the mineral.

A New Approach (cont.)

- Use group and individual results to reconstitute groups

A New Approach (cont.)

- Use group and individual results to reconstitute groups
- Each new group has the same suite of minerals as original.
- New groups address differences in original answers before making final decision.
- Alter the end of the lab exercise based upon assessment results.

Identify the Mineral

- Data that student entered
- Choose any mineral in set
- Submit final answer

Student Results

- Use progress screen/data
- Use identification results
- Use both to constitute new groups

Student View

- Each physical test/observation is an independent event.
- Web records initial responses but doesn’t affect final grade.
- Students discuss final identifications with peers.
- Reinforces how to differentiate similar minerals.
- Minerals from different groups are the same but ‘look’ different.
Teaching Assistant View

- Use class assessment
  - Did I do a good job with 'luster'...hardness’?
- Use group assessment
  - Which groups are having trouble?
  - Which parts of the exercise are the most difficult for each group?
- For ‘new’ assistants
  - Is it me or the students?
  - What should I do if they finish early or don’t finish at all?

Faculty View

- How well are my assistants teaching?
- What tests/observations are the most problematic to student understanding?
- How much material can be covered in lab?

Results from 1st Attempt

- Statistical
  - 4 sections of 22 students using new approach
  - 4 sections using traditional approach
  - 2 TAs using one traditional/one new approaches

- Aandedotoral
  - Students like using ‘cool’ technology
  - Student understanding of the methods improved
  - Student morale improved if the process worked smoothly

Roadblocks to Success

- Technical problems
  - PDAs aren’t made for this use
    - Power saving features
    - Network connections

- Pocket browser
  - Connection to web server
  - Made for offline browsing
  - Limited capabilities
Roadblocks to Success

- Technical problems
  - PDAs aren’t made for this use
  - Pocket browsers
  - Network traffic
    - Timing of network load
    - Wireless traffic

- Personnel problems
  - TAs inexperience
  - Technical expertise needed (web and network)
  - Faculty inexperience

Version 2

- Remove network impediments
- Move computational tasks to server
- Improve training for TAs
- Build database of results