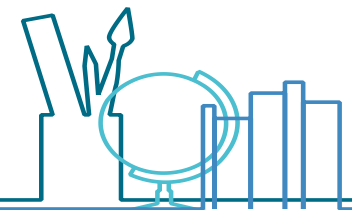


Daria Makarova



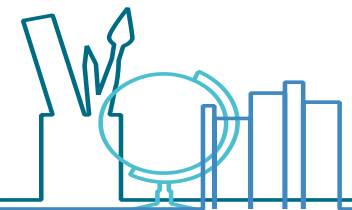
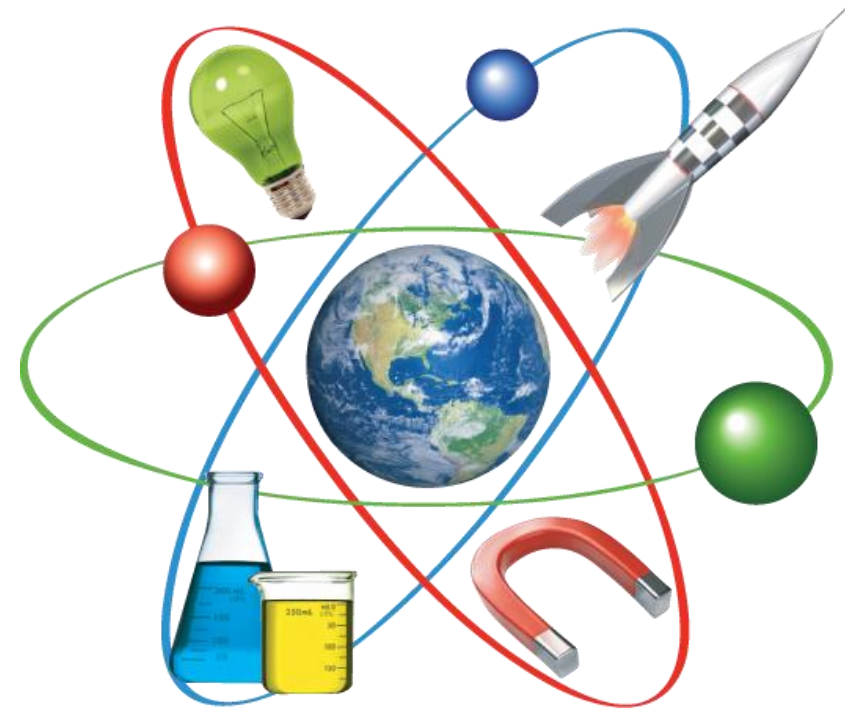
The effect of practice testing on attainment in KS4 Science: background

- Evidence for the ‘testing effect’ (Adesope et al., 2017): completing a low-stakes practice test improves future performance in high-stakes test (*quick and easy intervention!*)
- Practice testing may aid retrieval processes leading to better recall of information compared to simply restudying the material
- **Problem: currently very little research has examined this effect at school level and outside the laboratory**



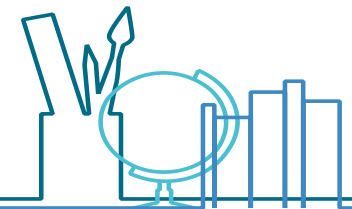
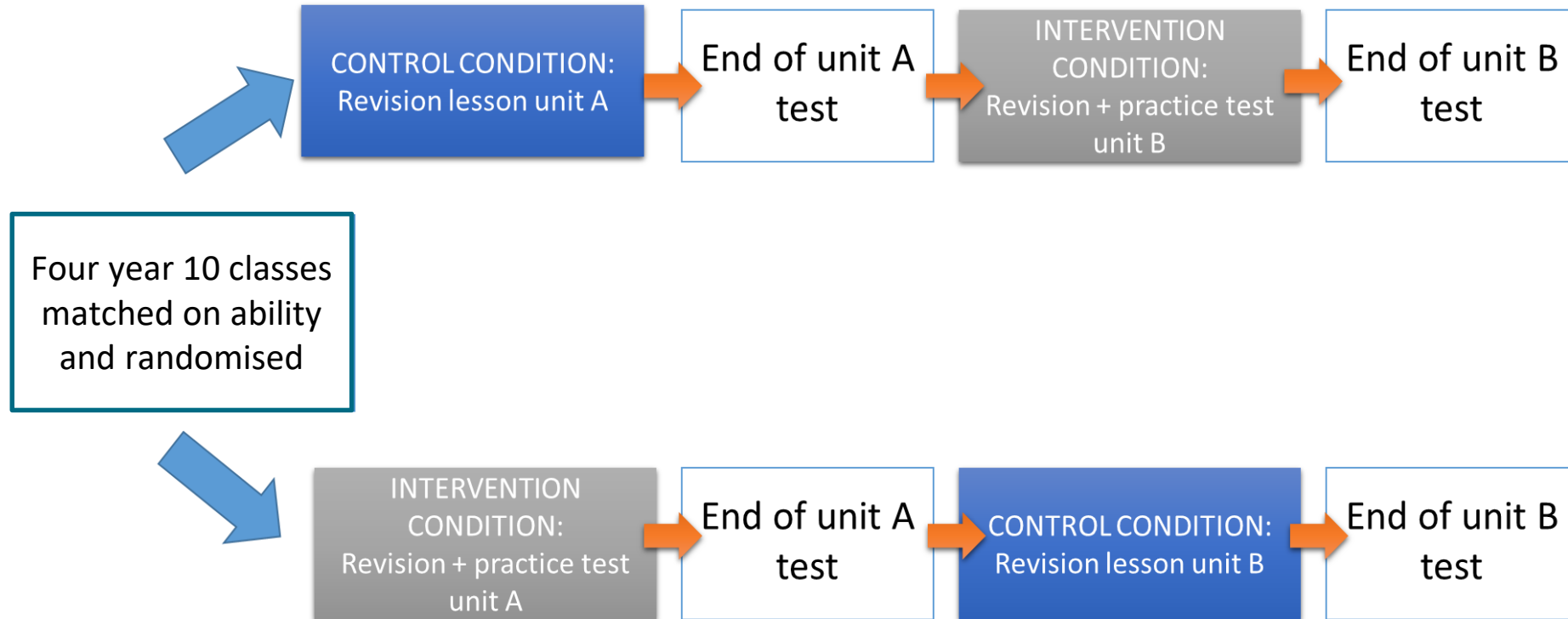
Application to the classroom: science

- Changes in the science curriculum
- Increased breadth and depth of the course at KS4
- More emphasis on application of science in exams
- No more coursework!





Trial design





Practice-test

- 35 minute practice-test followed by self-assessment (teacher explains answers)
- Composed of questions from the same exam board as the end of unit test with a mixture of multiple choice and short answer questions
- Administered one lesson before the real end of unit test (1-2 days)

exampro

Name: _____

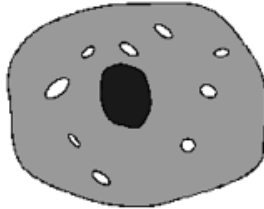
Class: _____

Date: _____


Time: **35 minutes**

Marks: **34 marks**

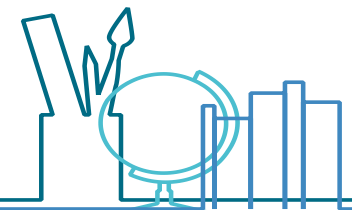
Q1.
The diagrams show a cheek cell from a human and a leaf cell from a plant.



Cheek cell



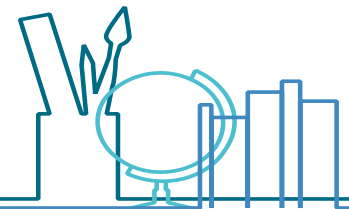
Leaf cell





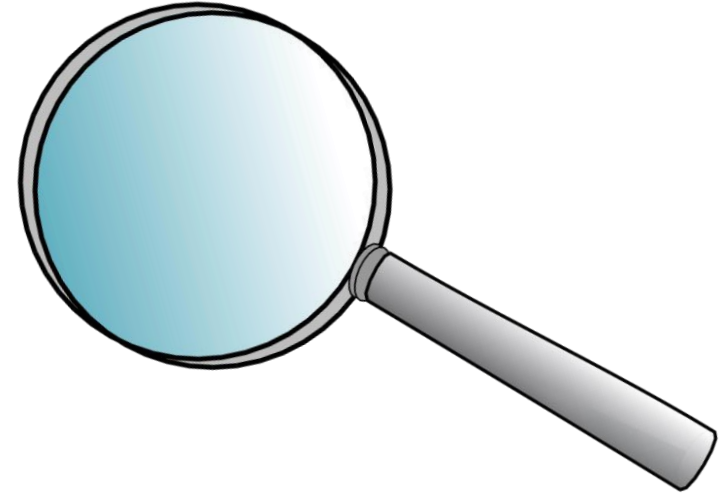
Analysis and results

- N= 110
- Wilcoxon signed-rank test showed that no statistically significant difference in end of unit test results following a practice test versus a standard revision lesson ($z=0.00$, $p=0.499$, one-tailed).
- Median test score following a practice test – 33
- Median test score following standard practice– 31.5
- Effect size very small ($r = 0.007$)





Sub-group analyses



- No significant differences in performance for SEN, pupil premium, HPA/MPA/LPA pupils

However...

- Pupils who performed poorly in the control condition (end of unit test following no practice test) , N=37 did significantly **better** in the intervention condition (end of unit test following practice test), (W= 3.75, p=0.001). Moderate effect size r=0.419
- And vice versa...Pupils who performed well in the control group, N=38 did significantly **worse** in the intervention condition, (W=2.79, p=0.003). Moderate effect size r=-0.306
- Differential effects on confidence/revision?



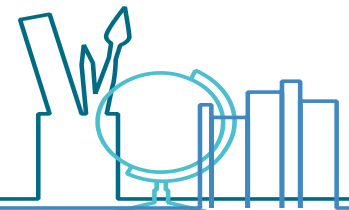
Barriers to classroom-based research

- **Staff turnover** –constant changes in staffing meant trial became very difficult to coordinate (timetable changed **three** times during this trial!)- led to attrition of groups



- **Time pressures** – data deadlines within school meant staff were unable to complete the practice-test

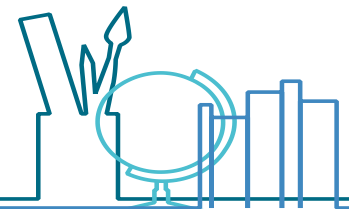
→ **Difficulties in controlling extraneous variables** (*e.g. delivery of content by teachers (involvement of student teachers in some groups)/ method of providing feedback by teachers/ revision sessions as standard practice/ revision time spent by pupils on each test*)





The benefits of classroom-based/ teacher-led research

- Teachers at the forefront of research; unique understanding of the:
 - 1) needs of the pupils & staff
 - 2) needs of the school
 - 3) needs of the curriculum
 - 4) practicalities of conducting the research
- Leads to careful consideration of interventions in schools
- Sub-group analyses allow for targeted interventions for particular groups of students



Next steps

- Consider alternative methods of practice-testing to aid recall e.g. interleaving practice/ daily testing and recapping
- Was the end of unit test high-stakes *enough*?
- Plan & control for possible extraneous variables such as lesson content & delivery
- Consider specific groups which pre-testing could benefit most: e.g. high-attaining students v low-attaining students?

