

why

There are three main goals of a Mathsquad Homework Program;

1. To maximise students' retention of key skills
2. To communicate to students and parents which skills are fundamental to students' learning of mathematics
3. To establish positive homework routines

what

- Weekly homework sheets covering the same skills each week

how

A recommended approach...

Choose a homework due day and communicate this to students when first distributing the booklets. Read through the information page at the start of the booklet to unpack structure and expectations.

Following this, each week on the homework due day carry out the following steps.

1. Ask students to open their booklets to the due sheet, possibly during a warm up activity, and tick off who has and hasn't done their homework (accountability)
2. *Students correct their own homework, perhaps using a projected copy of the solution file (immediate feedback)*
3. Students document their results on their Progress Chart (observable improvement)
4. Ask students who has improved and celebrate (positive reinforcement)
5. After the lesson ends, follow up with students who did not submit their homework to discuss the next steps (accountability)

considerations

Initially students are unlikely to be able to complete all the questions within a homework sheet. For some teachers, students and parents, this can cause some uneasiness. Homework is generally seen as a task to be completed in full, however this requirement is often unachievable for many students and can lead to unhelpful acts of copying answers or students not submitting anything at all. Mathsquad homework sheets are set with the expectation that students are to complete as many questions as they can each week. I believe it is much more important for students to give their best effort and try to improve over time than to copy a friend's answers. For more information on Skill Development please refer to the modifications section on the following page.

elaborations

Documenting Homework

Organisation and ability to meet deadlines are important skills that can be developed within the school environment. To best support students' development of these skills it is helpful to document their homework completion history. To do this, I create a grid with students' names in the first column followed by a column for each homework sheet for the term. I print it on coloured paper so I can find it easily and bring it to each lesson. On the homework due day I put a tick next to students who complete the homework sheet on time and an L next to those who have forgotten their homework. This sheet is useful during reporting, parent-teacher conferences and also in following up on late homework with consequences.

Consequences

The homework routine is both straight forward and achievable; students are encouraged to give their best effort and submit one homework sheet each week on the given homework day. For this reason, there are minimal excuses students can have for not doing their homework. That said, a 100% submission rate is incredibly rare! Because I believe there are great benefits in completing a weekly homework sheet I have consequences for those who don't submit their homework when it's due, unless there's a very good reason for it of course.

1. Student stays back immediately after the lesson to be reminded of the next steps (see step 2 and 3 below)
2. If by the following lesson (or two) the student has completed their homework they stay back after the lesson to correct their homework, and if after a second (or third chance) they still don't complete their homework...
3. The student is issued with an after-school detention and parents are notified.

The Progress Chart

The Progress Chart is a grid that gives students space to document their progress once their homework sheets have been corrected. The central columns give space for each homework sheet and students use a highlighter to document which questions have been correctly completed. Having a visual representation of their progress is a great motivator for students. It also shows students and teachers what skills are known and what skills need to be learnt or improved. This is particularly valuable if there is class time allocated to reviewing skills of difficulty and/or time for students to improve a skill of their choice.

modifications

Incorporate formal assessments

Before starting the homework program, I run a pre-test to see what skills students already have. Then, at the end of each term I complete another assessment so I can track students' progress over time. From these progress assessments I can celebrate students' learning and put measures in place for students who haven't progressed as much as I'd hoped. I find that the formal assessments increase the effort students' input into their learning, especially if they are getting assistance when completing their homework.

Incorporate skill development work

Even though the majority of skills come from Grade 5 or earlier, it is often the case for most students that they cannot complete all skills straight away. Schools can subscribe to Mathsquad's video tutorial and skill development webpages to enable parents and students to fill in the gaps in their skills. For more information on please head to <https://mathsqquad.org/videos>.

Teacher corrects homework outside class

Step 2 of the above routine involves students correcting their homework during class. While this allows for immediate feedback, exposes students to some exemplary working out and maximises the time students have available to complete the following week's homework, I would recommend that teachers correct students' homework outside of class from time to time. By correcting the homework sheets myself I can see what types of mistakes students are making and address these as a class. It also gives me the opportunity to give students feedback. A little tip on this is to provide the feedback on the homework sheet for the following week as students are more likely to act on the feedback if it is connected to some work they are about to complete. Seeing students' work two to three times each term seems to be a good balance, so if incorporating the formal assessments, one or two mid-term teacher corrections are likely to be sufficient.

support from research

Theories around spaced practice and the retrieval effect support the use of repetitively revisiting the same skills over an extended period of time as an effective strategy for improving retention. Spaced practice, as the phrase elicits to, refers to the process of giving students multiple opportunities to practice a given skill spaced over time. This strategy, sometimes referred to as multiple exposures, has been identified as one of ten High Impact Teaching Strategies (HITS) by the department of Education (2017) and Hattie (2009) found an effect size of 0.71 for spaced practice compared with the effect size of 0.41 for massed practice. Similarly, the retrieval effect is a widely replicated finding that the retrieval of information produces learning (Dunlosky et al., 2013). While the concept of 'if you don't use it, you lose it' is familiar to almost everybody, it is good to know it's backed up by research!

references:

High Impact Teaching Strategies. (2017, June). Department of Education and Training Melbourne. Retrieved from www.education.vic.gov.au/Documents/school/teachers/support/highimpactteachstrat.pdf
Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J. & Willingham, D. T. (2013). 'Improving students' learning with effective techniques: promising directions from cognitive and educational psychology', *Psychological Science in the Public Interest* 14 (1) pp. 4-58.