The Algebra Game FAQs

graphs *What are the benefits to my students and my classroom?*

- Easy transition into cooperative learning
- Many opportunities for ***all*** students to write about their observations and describe their thinking
- Easy classroom implementation with student-ready black line masters in the Teacher Manuals for each Topic Set
- High motivation for students for reviewing, identifying patterns for formulas, and remembering relationships
- Several different assessment options: writing, matching, fill-in-the-blanks, discussion results, and more.
- Constructivism-based results because the results come from students' observations
- Clear emphasis of algebra, graph, and number pattern relationships
- An organized structure of mathematics as a system is more obvious to students
- More students understand the connections between the graphs and equations
- Students actually enjoy the experience!

analysis *How long will it take to prepare to use the card decks in my classroom?*

- You can use the decks tomorrow when you get started with just the pair matching (like Concentration) activity or the "Walkabout" described in the teacher's manual. (The Walkabout: each student is given a card either as they enter class or after everyone is in and settled. Students are give 10 minutes or less to find the person or persons who match to their card – equations to graphs to point pair tables, etc)
- Other students just prefer to have the decks and try to match the cards to each other without assistance. As long as they have the Clue Sheet in the teacher's manual they are content to figure out matches and make conjectures. The time required is to make a copy of the Clue Sheet for each group.
- Every activity has a sheet of discussion questions for students to record their thinking; the only time required is the time to make copies of the black line masters (in some schools that takes longer than in other schools).

models *How many decks do I need for students who are in cooperative learning groups in my classroom?*

- The Topic Sets have one deck of each level of difficulty. If you require that *ALL* students have the same cards, then you need the same number of each kind of deck as number of groups.
- Many teachers are separating each deck into two sets since there are 12 sets in a deck so each group has 6 sets so they need one deck per two groups.
- Other teachers use all 4 decks in a Topic Set and let the different groups have the different levels so that classroom reporting reflects a variety of observations.
- If your school has the funds, a Classroom Set is the best of all worlds. The Classroom Set of each Topic

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has four decks of each deck level a, b, c, d and one teacher's manual. Special order the classroom set from The Math Studio, Inc., or order four Topic Sets.

explorations

How can The Algebra Game help my students pass the state graduation requirement math test?

- The Algebra Game activities require students to match all of the components of the algebraic information for each topic so that the students can make appropriate associations among the components, a direct advantage to getting correct responses to the multiple choice format questions.

- The discussion questions and the pattern arrangement activities in the Algebra Game require students to both make appropriate observations AND prove supportive arguments for their conjectures, a direct benefit to answering short-answer and open-response questions.

graphs analysis models explorations

How does The Algebra Game compare with the NCTM Principles and Standards for School Mathematics?

I. Principles

✓ The Equity Principle: *resources and support for all classrooms and all students*

✓ The Curriculum Principle: *focus on important mathematics – reasoning, making conjectures, and developing sound deductive arguments*

✓ The Teaching Principle: *worthwhile tasks which are intriguing with a level of challenge that can be approached in more than one way; also includes the organization and orchestration of students' work*

✓ The Learning Principle: *create autonomous learners…who can learn more and better when they take control of their learning …. and reflect on their own thinking*

✓ The Assessment Principle: *assembling evidence from a variety of sources is more likely to yield an accurate picture*

✓ The Technology Principle: *the computational capacity of technological tools extends the range of problems accessible to students … allowing more time for conceptualizing and modeling*

II. Standards for 6 – 8 and 9 - 12

✓ Number and Operations: the range of number types from integers to complex numbers is controlled within the difficulty levels of the decks

✓ Algebra: *students make generalizations from card pattern arrangements and are asked to compare and contrast different representations of the same function*

✓ Problem Solving: *students need to learn the strategies inherent in effective problem solving methods before being presented with context rich word problems therefore students are asked to discover and explore components of each kind of equation.*

✓ Reasoning and Proof: *students are asked to make conjectures about card relationships, write about their observations, and then test their conjecture and/or observation with new information*

✓ Communication: *all lesson topics have student sheets with writing spaces so students can write observations about patterns and connections*

✓ Connections: *every deck has 12 examples of particular topic equations with related algebraic and graphic representations for students to match and use with activities*