

MATH ICON CARDS



To access and print the entire instructions and ways to use the Math Icon Cards, visit www.jtayloreducation.com and go to "Product Instructions."

Phone: 951-837-0243 Fax: 866-729-4817 email: info@jtayloreducation.com

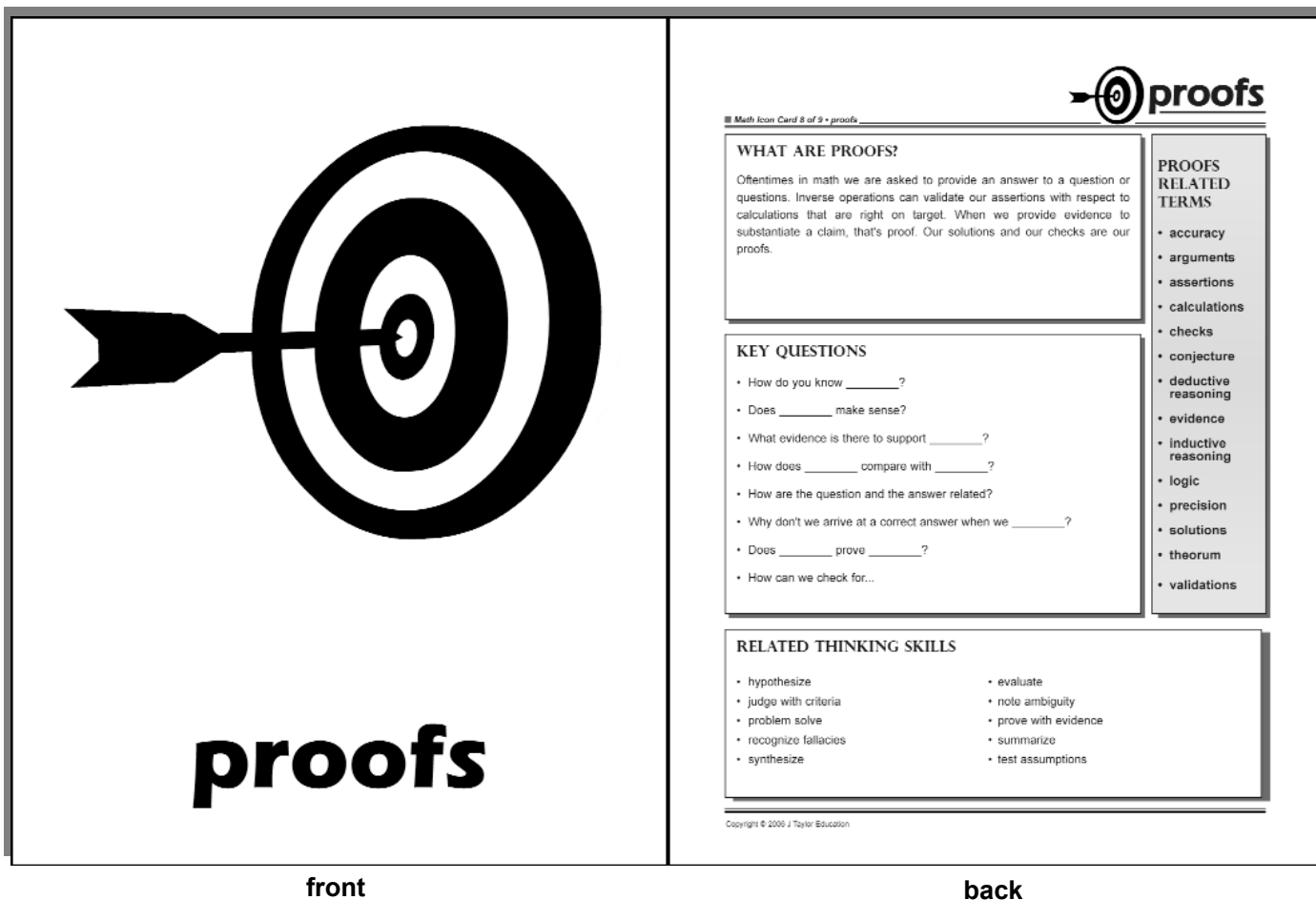
JTAYLOR
EDUCATION

View other products at our website:
www.jtayloreducation.com

Math Icon Cards Copyright © 2006 Melanie Montgomery

ABOUT THE MATH ICON CARDS

The Math Icons are intended to promote a deeper, broader understanding of math concepts. Individual math icons are illustrated on the cards of the set. The reverse side of each card contains an explanation of each icon, related terms, key questions, and related thinking skills. These lists provide a starting point for teachers to guide their students when using the icons. Teachers may also create their own informational lists in order to match the grade level standards and the needs of their students.



front

back

INTRODUCING THE MATH ICONS

It is recommended that the Math Icons be introduced one or two at a time. Many of them lend themselves to obvious inclusion at specific curricular junctures. Take for example, **conversion**, which could be introduced with addition (in the primary grades), or with measurement, or percents (upper elementary grades). **Expressions** might be introduced as a means of organizing relevant information to be considered when problem solving, or with the formulas needed to succeed in geometry.

You might choose to introduce the icons in pairs.

Introducing **balance** and **imbalance** together, would set the stage for classifying, categorizing, and sequencing.

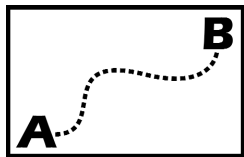


balance

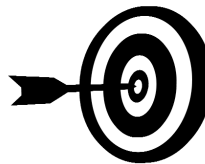


imbalance

Presenting **strategies** and **proofs**, as a pair, provides for the progression from How can we solve a given problem? to Let's check our answer for accuracy.

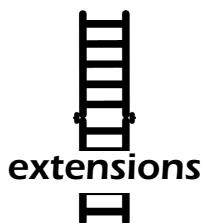


strategies



proofs

An exploration of **extensions** might lead to student **inquiry**, and research with respect to an accepted mathematical practice or theorem. It may also lead to cross-curricular questioning and reasoning.



extensions



inquiry

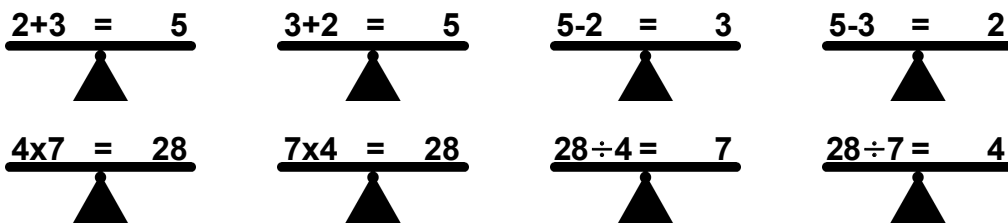
However you choose to introduce the Math Icons, accessibility in the classroom is paramount. Students should be encouraged to reference the icons as they see fit, making connections, observations, inquiring, and drawing conclusions as the academic year progresses.

USING THE MATH ICONS TO PROMOTE MATH CONCEPT DEVELOPMENT

The Math Icons can be utilized to aid students in understanding and grasping a number of mathematical concepts.

The **balance** icon might be used to explain fact families.

Example:



Students might be encouraged to use charts, graphs and diagrams to organize information and develop questions or ponderings related to a number of different concepts.

Example:

4+2 = 6

	$\begin{matrix} \bullet\bullet + \bullet = \bullet\bullet\bullet \\ 4 + 2 = 6 \end{matrix}$	
	$\begin{matrix} 4+2 \neq 5 & 4+2 > 5 \\ 4+2 \neq 7 & 4+2 < 7 \end{matrix}$	
	<ul style="list-style-type: none"> • I can use my fingers • I can use counting bears 	<ul style="list-style-type: none"> • I can use a number line • I can use tally marks
	<p>I will set the table for my family plus two guests. I need six plates, six forks, and six cups. My mom says that I can have four friends from school and two friends from soccer at my birthday party. I need to make six invitations.</p>	

Older students might produce frames using any number of the Math Icons.

Example:

x=fruit flies Jack started with

$$x+2x+4x+8x+16x+32x=189$$

$$63x=189$$

$$x=\frac{189}{63}$$

$$x= 3$$

Given that Jack started with three fruit flies, how many days would it be before his population numbered over 1,000,000? How many fruit flies would Jack have had on the sixth day if he'd started with only two fruit flies? What if he'd started with ten fruit flies?

Jack is breeding fruit flies. His population doubles everyday. If after the sixth day Jack has 189 fruit flies, how many fruit flies did Jack start with?

How long does a fruit fly live? Do fruit flies lay eggs? Do they birth live young? Why might a Biologist breed fruit flies? Are there populations that double on a daily basis?

$\begin{array}{r} 63X \\ X \quad -32X \\ 2X \quad -16X \\ 4X \quad -8X \\ 8X \quad -4X \\ 16X \quad -2X \\ + 32X \\ \hline 63X \end{array}$	$\begin{array}{r} 189 \\ 3 \quad -96 \\ \hline 93 \\ 6 \quad -48 \\ \hline 45 \\ 12 \quad -24 \\ \hline 21 \\ 24 \quad -12 \\ \hline 9 \\ 9 \quad -9 \\ \hline 0 \end{array}$
---	---

Whenever and wherever the Math Icons are used, you will see in your students an increased awareness of broader mathematical concepts. Your students will become both familiar with and confident using the math icons to explore the world of mathematics. They will be developing a number sense that will serve them well.

DIFFERENTIATING THE CORE CURRICULUM

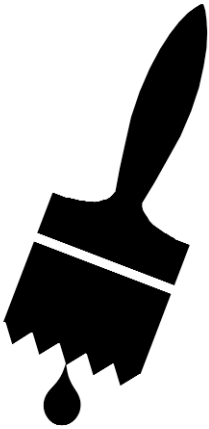
The Math Icons prompt gifted students and students talented in mathematics to pursue a more complete knowledge of the ways and whys of how math works.

A simple exploration of squaring positive integers, using the **extensions** icon as a prompt, could easily result in pattern finding and an interest in cubes, or finding the values of whole numbers taken to the fourth, fifth or nth power. Students might also be intrigued to explore the first and zero powers.

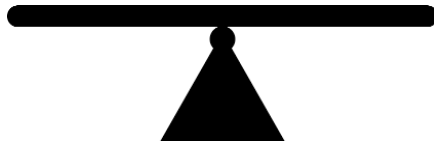
$2^7=128$	$3^5=243$
$2^6=64$	$3^4=81$
$2^5=32$	$3^3=27$
$2^4=16$	$3^2=9$
$2^3=8$	$3^1=3$
$2^2=4$	$3^0=1$

You will witness your students' education being enhanced by this simple set of easily remembered and reproduced icons that encourage and facilitate the posing of probing questions, thinking about math concepts as opposed to algorithms only, and researching the origin of theories and math history. Gifted students, as well as other students of varied levels of proficiency in mathematics, will benefit from the opportunity to explore mathematical concepts in depth, and to reflect about the way they think about math.

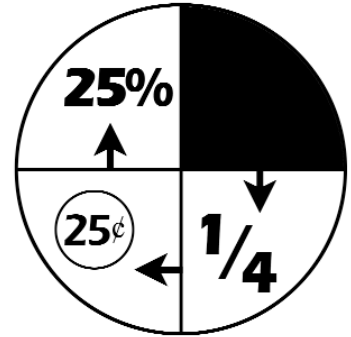
MATH ICON CARDS



applications



balance



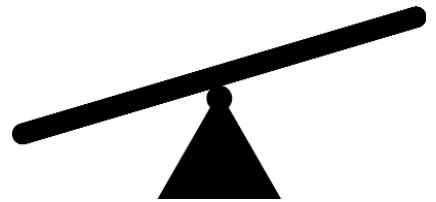
conversion

$$M + \frac{a}{th}$$

expressions



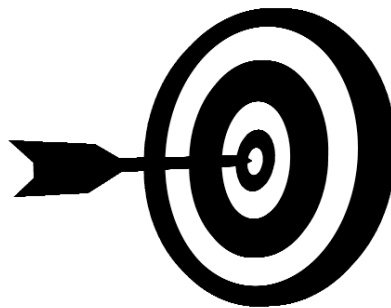
extensions



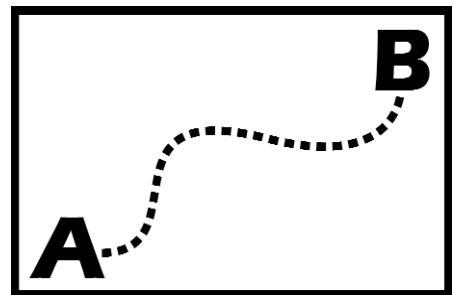
imbalance



inquiry



proofs



strategies