

Four Dimensions of Effort: Precision, Accuracy, Persistence and Intensity ('PAPI')

A simple pencil-and-paper task has been created to enable teachers and students to explore the four dimensions of precision, accuracy, persistence and intensity of effort. The task presents the learner with a series of similar signs arrayed in rows and columns. The learner needs to strike a line only through the target signs. Four levels of difficulty are formed by varying the number of target signs, the number of distracting signs and the total number of items in the grid. The similarity of the signs and their number create a perceptual overload that puts precision, accuracy and persistence into play. Intensity is put into play by imposing a time constraint ("Let's see how many we can do in 60 seconds"). Remember that the objective of this activity is to gain familiarity with the four dimensions of effort. Students do not need to complete any of the grids although some may wish to do so simply for the sake of stepping up to the challenge. Introduce the grids in a lighthearted manner and have fun with them on the way to learning about the dimensions of effort. Connect the work on these tasks and the insights gained to other situations in and out of school where students need to regulate their effort (see sections B5: R-9 and B5: C-7 of the MindLadder LearningGuide Advisor for more information about this knowledge construction function).

The characteristics of the four levels of the task are summarized below. Pick the level that is right for your students' age and level of functioning. There is no need to do them all. The same signs (12) are used in all four levels of the task.

Level I: 1 target sign in a 4 x 5 array.

Level II: 2 target signs in a 10 x 10 array.

Level III: 3 target signs in a 15 x 15 array.

Level IV: 4 target signs in a 20 x 27 array.

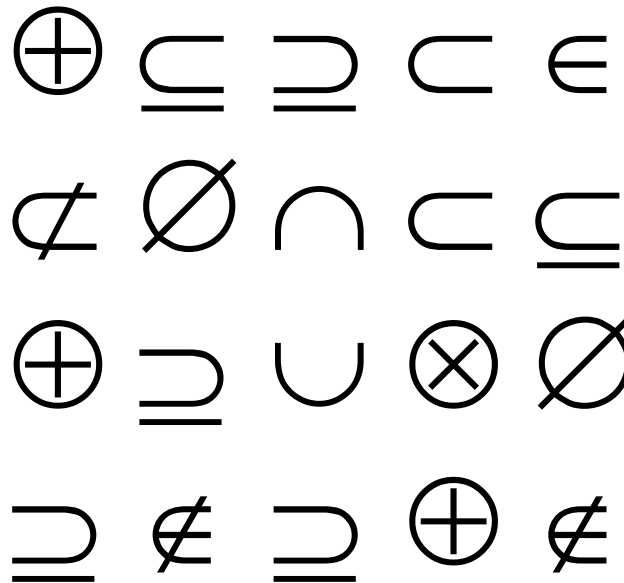
To highlight the dimensions of effort you and your students can together decide on suitable time intervals. For example, shorter time intervals will suffice for the study of intensity. Longer intervals are needed to bring out the dimension of persistence. Observe and discuss with your students what happens to precision and accuracy in different time intervals. Enjoy this activity!



Name: _____ Date: _____

School: _____ Grade: _____ Age: _____

Strike a line only through:





Name: _____ Date: _____

School: _____ Grade: _____ Age: _____

Strike a line only through:

\otimes \cup

\otimes	\supseteq	\subseteq	\subset	\oplus	\in	\notin	\emptyset	\cup	\oplus
$\not\subset$	\otimes	\cup	\cap	\in	\emptyset	\supseteq	\cup	\subseteq	\supseteq
\supseteq	\subset	\notin	\otimes	\cup	\oplus	\supseteq	\otimes	\cup	\cup
\oplus	\in	\oplus	\cap	\notin	\subset	$\not\subset$	\supseteq	\supseteq	\emptyset
\supseteq	\notin	\subset	$\not\subset$	\oplus	\otimes	\notin	\cup	\oplus	\oplus
\oplus	$\not\subset$	\in	\emptyset	$\not\subset$	\supset	\cap	\subset	\supseteq	\cap
\otimes	\supseteq	\in	$\not\subset$	$\not\subset$	\supseteq	\subseteq	\emptyset	\cup	\otimes
$\not\subset$	\supset	\otimes	\subseteq	\otimes	\cap	\subseteq	\supset	\notin	\in
\supseteq	\subseteq	\subset	$\not\subset$	\emptyset	\notin	\cap	\cap	\subset	\subseteq
\in	\notin	$\not\subset$	\oplus	\cup	\subseteq	\supset	\notin	\cap	\supseteq



Name: _____ Date: _____

School: _____ Grade: _____ Age: _____

Strike a line only through:

$\subseteq \oplus \supset$

\oplus	\subseteq	\supseteq	\subset	\in	\emptyset	\oplus	\subset	\supset	\otimes	\emptyset	$\not\subset$	\subset	\notin	\cap
$\not\subset$	\emptyset	\cap	\subset	\subseteq	\oplus	\supset	\otimes	\cap	$\not\subset$	\notin	\oplus	\cup	\emptyset	$\not\subset$
\cap	\supset	\emptyset	\subseteq	\otimes	\subset	\cup	\supset	\cap	\emptyset	\supset	\subset	\in	\in	\oplus
\oplus	\supseteq	\cup	\otimes	\emptyset	\oplus	\in	$\not\subset$	\supseteq	\cup	\oplus	\oplus	\subset	\supseteq	\subseteq
\in	\cap	\in	\subset	\in	\supseteq	\subseteq	\in	\otimes	$\not\subset$	\supset	\notin	\otimes	$\not\subset$	$\not\subset$
\supseteq	\notin	\supseteq	\oplus	\notin	\cup	$\not\subset$	\subset	\cap	\emptyset	\cap	\subset	\cap	\supseteq	\emptyset
\in	$\not\subset$	\subset	\notin	\subset	\oplus	\otimes	\supseteq	\subseteq	$\not\subset$	\otimes	\supseteq	$\not\subset$	\oplus	\supseteq
\cup	\otimes	\emptyset	\otimes	\notin	\oplus	\in	\supseteq	\supset	\notin	\subseteq	\subset	\emptyset	\supset	\in
\otimes	\subseteq	\subset	\cap	\oplus	\emptyset	\cup	\cup	\notin	\cap	\emptyset	\oplus	\supseteq	\oplus	\cap
\supset	$\not\subset$	\cap	\otimes	\cup	\supseteq	\oplus	\supseteq	\notin	\subset	\cup	$\not\subset$	\notin	\in	\subset
\notin	\cup	\emptyset	\notin	\subset	\notin	$\not\subset$	\supseteq	\subset	\notin	\in	\notin	\emptyset	\supseteq	\emptyset
\oplus	\oplus	\subseteq	\supset	\cap	$\not\subset$	\cap	\otimes	\supset	\otimes	\cap	\subset	\in	\supseteq	\otimes
\supseteq	\supset	\subset	\cup	\notin	\cup	\in	\notin	\emptyset	\in	\oplus	\otimes	\in	\subseteq	\cup
$\not\subset$	\in	\supseteq	\otimes	$\not\subset$	\supseteq	\supset	\subset	\supseteq	\supset	\subseteq	\cup	\supset	\in	\emptyset
\supseteq	\notin	\emptyset	\subset	\otimes	$\not\subset$	\in	\oplus	\cap	\otimes	\supseteq	\subset	\cup	\cap	\supseteq



Name: _____ Date: _____

School: _____ Grade: _____ Age: _____

Strike a line only through:

€ ⊗ ⊃ ∪

⊕	⊆	⊇	⊂	€	∅	⊕	⊂	⊃	⊗	∅	⊄	⊂	≠	∩	⊂	∪	⊗	⊇	⊆	⊂	⊕	€	≠	∅	∪	⊕
⊄	∅	∩	⊂	⊆	⊕	⊃	⊗	∩	⊄	≠	⊕	∪	∅	⊄	⊕	⊃	⊄	⊗	∪	∩	€	∅	⊇	∪	⊆	⊇
∩	⊃	∅	⊆	⊗	⊂	∪	⊃	∩	∅	⊃	⊂	€	€	⊕	∅	⊆	⊇	⊂	≠	⊗	∪	⊕	⊇	⊗	∪	∪
⊕	⊇	∪	⊗	∅	⊕	€	⊄	⊇	∪	⊕	⊕	⊂	⊇	⊆	∪	⊃	⊕	€	⊕	∩	≠	⊂	⊄	⊇	⊇	∅
€	∩	€	⊂	€	⊇	⊆	€	⊗	⊄	⊃	≠	⊗	⊄	⊄	∩	⊆	⊇	≠	⊂	⊄	⊕	⊗	≠	∪	⊕	⊕
⊇	≠	⊇	⊕	≠	∪	⊄	⊂	∩	∅	∩	⊂	∩	⊇	∅	€	∪	⊕	⊄	€	∅	⊄	⊃	∩	⊂	⊇	∩
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∪	⊗	∅	⊗	≠	⊕	€	⊇	⊃	≠	⊆	⊂	∅	⊃	€	∩	∅	⊄	⊃	⊗	⊆	⊗	∩	⊆	⊃	≠	€
⊗	⊆	⊂	∩	⊕	∅	∪	∪	≠	∩	∅	⊕	⊇	⊕	∩	⊕	⊃	⊇	⊆	⊂	⊄	∅	≠	∩	∩	⊂	⊆
⊃	⊄	∩	⊗	∪	⊇	⊕	⊇	≠	⊂	∪	⊄	≠	€	⊂	∪	⊗	€	≠	⊄	⊕	∪	⊆	⊃	≠	∩	⊇
≠	∪	∅	≠	⊂	≠	⊄	⊇	⊂	≠	€	≠	∅	⊇	∅	⊃	∩	⊆	∩	∅	⊃	∩	⊗	€	⊇	⊇	∪
⊕	⊕	⊆	⊃	∩	⊄	∩	⊗	⊃	⊗	∩	⊂	€	⊇	⊗	⊆	⊇	⊄	⊃	⊗	€	⊃	∅	⊆	⊇	⊃	⊄
⊇	⊃	⊂	∪	≠	∪	€	≠	∅	€	⊕	⊗	€	⊆	∪	∩	⊇	⊆	€	⊗	⊂	∩	⊕	€	⊃	⊄	⊕
⊄	€	⊇	⊗	⊄	⊇	⊃	⊂	⊇	⊃	⊆	∪	⊃	€	∅	≠	⊆	∩	∅	∪	∅	€	⊗	∅	≠	⊆	⊗
⊇	≠	∅	⊂	⊗	⊄	€	⊕	∩	⊗	⊇	⊂	∪	∩	⊇	⊄	⊇	⊆	⊃	⊗	⊂	⊆	⊄	€	∪	∪	⊃
€	⊗	⊕	⊆	∪	⊃	⊇	≠	∪	⊗	∪	∅	∪	⊄	€	⊄	⊗	⊄	€	⊂	€	∪	⊂	⊄	∩	⊕	∩
⊕	∩	∩	∪	⊂	≠	€	⊃	∩	⊂	∩	∪	≠	∅	⊂	⊆	⊕	∩	€	≠	∅	⊆	€	⊆	⊇	∅	⊃
≠	⊇	⊃	∅	⊆	⊕	≠	∪	≠	⊗	⊆	⊃	€	⊗	⊄	€	€	∅	⊇	⊆	⊕	⊕	≠	∩	⊂	∪	⊆
⊆	∅	⊕	∪	∅	≠	⊕	∩	⊂	∪	€	⊇	⊆	∪	∅	∩	∅	⊄	≠	€	⊂	⊗	⊕	⊗	⊆	⊄	€
⊄	⊂	≠	∩	⊆	⊂	≠	⊗	⊂	⊃	⊂	⊄	€	∅	⊄	⊕	⊂	∅	⊗	∩	∪	≠	∅	⊇	⊃	⊇	⊆