SUPER CAR: Multiplying and Factoring Integers

Note: This game treats subtraction as addition of the opposite: $a - b = a + {}^{-}b$.

The Distributive Property of Multiplication over Addition

The **distributive property of multiplication over addition**, $a(b + c) = ab + ac$, says that when a number multiplies an indicated sum (addition expression enclosed in parentheses), the result is the same as when the number multiplies each addend in that sum; for example, ${}^{-}6 \times (5 + {}^{-}3) = {}^{-}6 \times 5 + {}^{-}6 \times {}^{-}3$.

Game Description and Materials

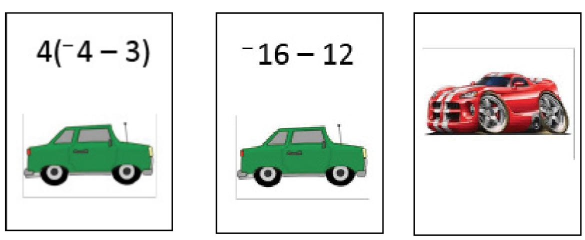
Super Car is a game for three or more players that uses the distributive property to give students mental math practice multiplying and factoring integers. Players match two cards with equivalent expressions, one in the form of $a(b + c)$ and the other in form of $ab + ac$.

Game materials include a deck of Cards.

The **object of the game** is to be the player who holds the Super Car card in his hand after all the matches have been made.

Cards

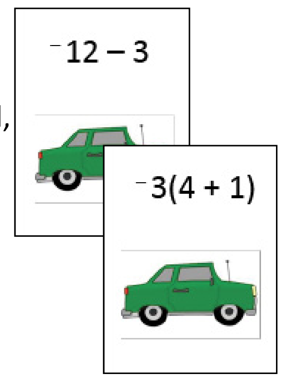
There are 41 cards: two cards for each pair of equivalent expressions, $a(b + c)$ and $ab + ac$, and one Super Car card.



Getting Ready to Play

The dealer shuffles the cards and deals them out to each player. Players organize their cards on the table in front of them. They make matches with the cards they were dealt and put each matching pair aside. When they have made all the possible matches, they pick up their cards and hold them so that the other players can pick cards (unseen) from their hand.

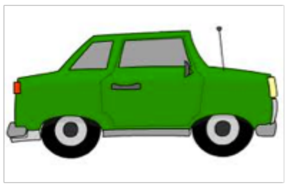
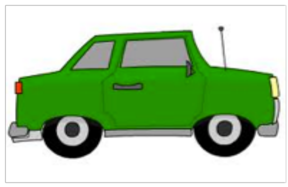
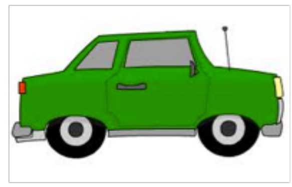
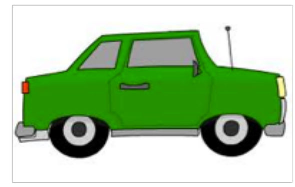
Let's Play!

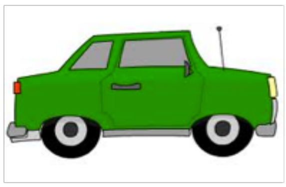
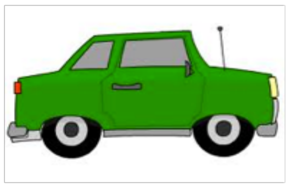
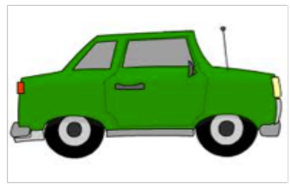
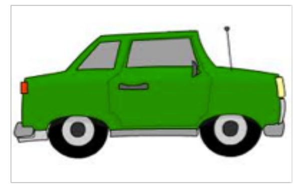


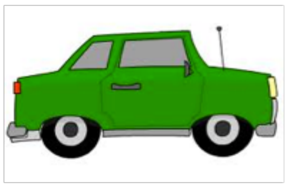
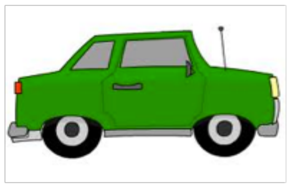
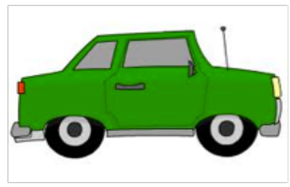
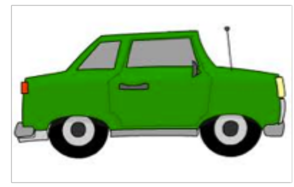
1. Players take turns picking one card from the hand of the player at their left. If the card is not the Super Car card, the player matches the card with one in his/her hand, if possible, and places the matched pair aside with the other matches. If no match can be made, the next player takes a turn.

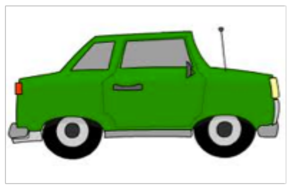
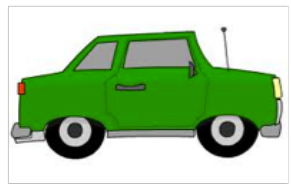
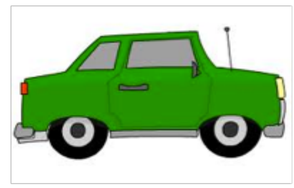
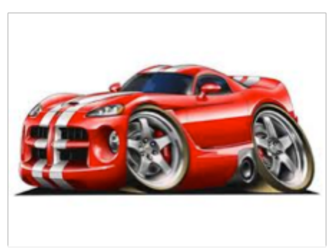
2. Play continues until one player runs out of cards.

3. The winner is the player who holds the Super Car card.

$2(^-6 + 1)$ 	$^-3(4 – 1)$ 	$4(^-4 – 3)$ 	$3(5 – 4)$ 
$^-3(^-5 – 6)$ 	$7(3 – 2)$ 	$8(3 – 2)$ 	$4(^-5 – 7)$ 
$5(15 – 8)$ 	$^-8(^-6 – 3)$ 		

$^{-}2(6 + 1)$ 	$^{-}3(4 + 1)$ 	$^{-}4(^{-}4 - 3)$ 	$3(^{-}5 - 4)$ 
$3(^{-}5 - 6)$ 	$7(^{-}3 - 2)$ 	$8(^{-}3 - 2)$ 	$^{-}4(^{-}5 - 7)$ 
$^{-}5(15 + 8)$ 	$^{-}8(^{-}6 + 3)$ 		

$^{-}12 + 2$ 	$^{-}12 + 3$ 	$^{-}16 - 12$ 	$15 - 12$ 
$15 + 18$ 	$21 - 14$ 	$24 - 16$ 	$^{-}20 - 28$ 
$75 - 40$ 	$48 + 24$ 		

$^{-}12 - 2$ 	$^{-}12 - 3$ 	$16 + 12$ 	$^{-}15 - 12$ 
$^{-}15 - 18$ 	$^{-}21 - 14$ 	$^{-}24 - 16$ 	$20 + 28$ 
$^{-}75 - 40$ 	$48 - 24$ 		

SERIOUS PLAY

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Answer Key

Note: This game treats subtraction as addition of the opposite: $a - b = a + {}^{-}b$.

$2({}^{-}6 + 1)$ ${}^{-}12 + 2$	${}^{-}3(4 - 1)$ ${}^{-}12 + 3$	$4({}^{-}4 - 3)$ ${}^{-}16 - 12$	$3(5 - 4)$ $15 - 12$
${}^{-}3({}^{-}5 - 6)$ $15 + 18$	$7(3 - 2)$ $21 - 14$	$8(3 - 2)$ $24 - 16$	$4({}^{-}5 - 7)$ ${}^{-}20 - 28$
$5(15 - 8)$ $75 - 40$	${}^{-}8({}^{-}6 - 3)$ $48 + 24$	${}^{-}5(15 + 8)$ ${}^{-}75 - 40$	${}^{-}8({}^{-}6 + 3)$ $48 - 24$
$3({}^{-}5 - 6)$ ${}^{-}15 - 18$	$7({}^{-}3 - 2)$ ${}^{-}21 - 14$	$8({}^{-}3 - 2)$ ${}^{-}24 - 16$	${}^{-}4({}^{-}5 - 7)$ $20 + 28$
${}^{-}2(6 + 1)$ ${}^{-}12 - 2$	${}^{-}3(4 + 1)$ ${}^{-}12 + 3$	${}^{-}4({}^{-}4 - 3)$ $16 + 12$	$3({}^{-}5 - 4)$ ${}^{-}15 - 12$