adc

add with carry

2 bytes   **2 cycles**

immediate mode

Example: adc #42

N **V** B D I **Z** **C**

adc

add with carry

2 bytes   **3 cycles**

zero page mode

Example: adc $12

N **V** B D I **Z** **C**

adc

add with carry

2 bytes   **4 cycles**

zero page, X mode

Example: adc $12,X

N **V** B D I **Z** **C**

adc

add with carry

3 bytes   **4 cycles**

absolute mode

Example: adc $1234

N **V** B D I **Z** **C**

adc

add with carry

3 bytes   **4/5 cycles**

absolute, X mode

Example: adc $1234,X

N **V** B D I **Z** **C**

adc

add with carry

3 bytes   **4/5 cycles**

absolute, Y mode

Example: adc $1234,Y

N **V** B D I **Z** **C**

adc

add with carry

2 bytes   **6 cycles**

pre-indexed indirect mode

Example: adc ($12,X)

N **V** B D I **Z** **C**

adc

add with carry

2 bytes   **5/6 cycles**

post-indexed indirect mode

Example: adc ($12),Y

N **V** B D I **Z** **C**

and

AND with accumulator

2 bytes   **2 cycles**

immediate mode

Example: and #42

N V B D I **Z** C

and

AND with accumulator

2 bytes **3 cycles**

zero page mode

Example: and $12

N V B D I **Z** C

and

AND with accumulator

2 bytes **4 cycles**

zero page, X mode

Example: and $12,X

N V B D I **Z** C

and

AND with accumulator

3 bytes **4 cycles**

absolute mode

Example: and $1234

N V B D I **Z** C

and

AND with accumulator

3 bytes **4/5 cycles**

absolute, X mode

Example: and $1234,X

N V B D I **Z** C

and

AND with accumulator

3 bytes **4/5 cycles**

absolute, Y mode

Example: and $1234,Y

N V B D I **Z** C

and

AND with accumulator

2 bytes **6 cycles**

pre-indexed indirect mode

Example: and ($12,X)

N V B D I **Z** C

and

AND with accumulator

2 bytes **5/6 cycles**

post-indexed indirect mode

Example: and ($12),Y

N V B D I **Z** C

asl

arithmetic shift left

1 byte **2 cycles**

accumulator mode

Example: asl

N V B D I **Z** **C**

asl

arithmetic shift left

2 bytes **5 cycles**

zero page mode

Example: asl $12

N V B D I **Z** **C**

asl

arithmetic shift left

2 bytes **6 cycles**

zero page, X mode

Example: asl $12,X

N V B D I **Z** **C**

asl

arithmetic shift left

3 bytes **6 cycles**

absolute mode

Example: asl $1234

N V B D I **Z** **C**

asl

arithmetic shift left

3 bytes **7 cycles**

absolute, X mode

Example: asl $1234,X

N V B D I **Z** **C**

bcc

branch if carry clear

2 bytes **2-4 cycles**

relative mode

Example: bcc foo

N V B D I Z C

bcs

branch if carry set

2 bytes **2-4 cycles**

relative mode

Example: bcs foo

N V B D I Z C

beq

branch if equal

2 bytes **2-4 cycles**

relative mode

Example: beq foo

N V B D I Z C

bit

bit test

2 bytes **3 cycles**

zero page mode

Example: bit $12

N **V** B D I **Z** C

bit

bit test

3 bytes **4 cycles**

absolute mode

Example: bit $1234

N **V** B D I **Z** C

bmi

branch if minus

2 bytes **2-4 cycles**

relative mode

Example: bmi foo

N V B D I Z C

bne

branch if not equal

2 bytes **2-4 cycles**

relative mode

Example: bne foo

N V B D I Z C

bpl

branch if plus

2 bytes **2-4 cycles**

relative mode

Example: bpl foo

N V B D I Z C

brk

break

1 byte **7 cycles**

implied mode

Example: brk

N V **B** D **I** Z C

bvc

branch if overflow clear

2 bytes **2-4 cycles**

relative mode

Example: bvc foo

N V B D I Z C

bvs

branch if overflow set

2 bytes **2-4 cycles**

relative mode

Example: bvs foo

N V B D I Z C

clc

clear carry

1 byte **2 cycles**

implied mode

Example: clc

N V B D I Z **C**

cld

clear decimal mode

1 byte **2 cycles**

implied mode

Example: cld

N V B **D** I Z C

cli

enable interrupts

1 byte **2 cycles**

implied mode

Example: cli

N V B D **I** Z C

clv

clear overflow

1 byte **2 cycles**

implied mode

Example: clv

N **V** B D I Z C

cmp

compare accumulator

2 bytes | **2 cycles**

immediate mode

Example: cmp #42

N V B D I **Z** **C**

---

cmp

compare accumulator

2 bytes | **3 cycles**

zero page mode

Example: cmp $12

N V B D I **Z** **C**

---

cmp

compare accumulator

2 bytes | **4 cycles**

zero page, X mode

Example: cmp $12,X

N V B D I **Z** **C**

---

cmp

compare accumulator

3 bytes | **4 cycles**

absolute mode

Example: cmp $1234

N V B D I **Z** **C**

---

cmp

compare accumulator

3 bytes | **4/5 cycles**

absolute, X mode

Example: cmp $1234,X

N V B D I **Z** **C**

---

cmp

compare accumulator

3 bytes | **4/5 cycles**

absolute, Y mode

Example: cmp $1234,Y

N V B D I **Z** **C**

---

cmp

compare accumulator

2 bytes | **6 cycles**

pre-indexed indirect mode

Example: cmp ($12,X)

N V B D I **Z** **C**

---

cmp

compare accumulator

2 bytes | **5/6 cycles**

post-indexed indirect mode

Example: cmp ($12),Y

N V B D I **Z** **C**

---

cpx

compare X register

2 bytes | **2 cycles**

immediate mode

Example: cpx #42

N V B D I **Z** **C**

cpx

compare X register

2 bytes   **3 cycles**

zero page mode

Example: cpx $12

N V B D I **Z** **C**

cpx

compare X register

3 bytes   **4 cycles**

absolute mode

Example: cpx $1234

N V B D I **Z** **C**

cpy

compare Y register

2 bytes   **2 cycles**

immediate mode

Example: cpy #42

N V B D I **Z** **C**

cpy

compare Y register

2 bytes   **3 cycles**

zero page mode

Example: cpy $12

N V B D I **Z** **C**

cpy

compare Y register

3 bytes   **4 cycles**

absolute mode

Example: cpy $1234

N V B D I **Z** **C**

dec

decrement memory

2 bytes   **5 cycles**

zero page mode

Example: dec $12

N V B D I **Z** C

dec

decrement memory

2 bytes   **6 cycles**

zero page, X mode

Example: dec $12,X

N V B D I **Z** C

dec

decrement memory

3 bytes   **6 cycles**

absolute mode

Example: dec $1234

N V B D I **Z** C

dec

decrement memory

3 bytes   **7 cycles**

absolute, X mode

Example: dec $1234,X

N V B D I **Z** C

dex

decrement X register

1 byte   **2 cycles**

implied mode

Example: dex

N V B D I Z C

---

dey

decrement Y register

1 byte   **2 cycles**

implied mode

Example: dey

N V B D I Z C

---

eor

EOR with accumulator

2 bytes   **2 cycles**

immediate mode

Example: eor #42

N V B D I Z C

---

eor

EOR with accumulator

2 bytes   **3 cycles**

zero page mode

Example: eor $12

N V B D I Z C

---

eor

EOR with accumulator

2 bytes   **4 cycles**

zero page, X mode

Example: eor $12,X

N V B D I Z C

---

eor

EOR with accumulator

3 bytes   **4 cycles**

absolute mode

Example: eor $1234

N V B D I Z C

---

eor

EOR with accumulator

3 bytes   **4/5 cycles**

absolute, X mode

Example: eor $1234,X

N V B D I Z C

---

eor

EOR with accumulator

3 bytes   **4/5 cycles**

absolute, Y mode

Example: eor $1234,Y

N V B D I Z C

---

eor

EOR with accumulator

2 bytes   **6 cycles**

pre-indexed indirect mode

Example: eor ($12,X)

N V B D I Z C

eor

EOR with accumulator

`2 bytes`   `5/6 cycles`

`post-indexed indirect mode`

Example: eor ($12),Y

N V B D I **Z** C

inc

increment memory

`2 bytes`   `5 cycles`

`zero page mode`

Example: inc $12

N V B D I **Z** C

inc

increment memory

`2 bytes`   `6 cycles`

`zero page, X mode`

Example: inc $12,X

N V B D I **Z** C

inc

increment memory

`3 bytes`   `6 cycles`

`absolute mode`

Example: inc $1234

N V B D I **Z** C

inc

increment memory

`3 bytes`   `7 cycles`

`absolute, X mode`

Example: inc $1234,X

N V B D I **Z** C

inx

increment X register

`1 byte`   `2 cycles`

`implied mode`

Example: inx

N V B D I **Z** C

iny

increment Y register

`1 byte`   `2 cycles`

`implied mode`

Example: iny

N V B D I **Z** C

jmp

jump

`3 bytes`   `3 cycles`

`absolute mode`

Example: jmp $1234

N V B D I Z C

jmp

jump

`3 bytes`   `5 cycles`

`indirect mode`

Example: jmp ($1234)

N V B D I Z C

jsr

jump to subroutine

`3 bytes` `6 cycles`

`absolute mode`

Example: jsr $1234

N V B D I Z C

lda

load accumulator

`2 bytes` `2 cycles`

`immediate mode`

Example: lda #42

N V B D I **Z** C

lda

load accumulator

`2 bytes` `3 cycles`

`zero page mode`

Example: lda $12

N V B D I **Z** C

lda

load accumulator

`2 bytes` `4 cycles`

`zero page, X mode`

Example: lda $12,X

N V B D I **Z** C

lda

load accumulator

`3 bytes` `4 cycles`

`absolute mode`

Example: lda $1234

N V B D I **Z** C

lda

load accumulator

`3 bytes` `4/5 cycles`

`absolute, X mode`

Example: lda $1234,X

N V B D I **Z** C

lda

load accumulator

`3 bytes` `4/5 cycles`

`absolute, Y mode`

Example: lda $1234,Y

N V B D I **Z** C

lda

load accumulator

`2 bytes` `6 cycles`

`pre-indexed indirect mode`

Example: lda ($12,X)

N V B D I **Z** C

lda

load accumulator

`2 bytes` `5/6 cycles`

`post-indexed indirect mode`

Example: lda ($12),Y

N V B D I **Z** C

ldx

load X register

2 bytes   2 cycles

immediate mode

Example: ldx #42

N V B D I Z C

ldx

load X register

2 bytes   3 cycles

zero page mode

Example: ldx $12

N V B D I Z C

ldx

load X register

2 bytes   4 cycles

zero page, Y mode

Example: ldx $12,X

N V B D I Z C

ldx

load X register

3 bytes   4 cycles

absolute mode

Example: ldx $1234

N V B D I Z C

ldx

load X register

3 bytes   4/5 cycles

absolute, Y mode

Example: ldx $1234,X

N V B D I Z C

ldy

load Y register

2 bytes   2 cycles

immediate mode

Example: ldy #42

N V B D I Z C

ldy

load Y register

2 bytes   3 cycles

zero page mode

Example: ldy $12

N V B D I Z C

ldy

load Y register

2 bytes   4 cycles

zero page, X mode

Example: ldy $12,X

N V B D I Z C

ldy

load Y register

3 bytes   4 cycles

absolute mode

Example: ldy $1234

N V B D I Z C

ldy

load Y register

3 bytes **4/5 cycles**

absolute, X mode

Example: ldy $1234,X

N V B D I **Z** C

lsr

logical shift right

1 byte **2 cycles**

accumulator mode

Example: lsr

N V B D I **Z** **C**

lsr

logical shift right

2 bytes **5 cycles**

zero page mode

Example: lsr $12

N V B D I **Z** **C**

lsr

logical shift right

2 bytes **6 cycles**

zero page, X mode

Example: lsr $12,X

N V B D I **Z** **C**

lsr

logical shift right

3 bytes **6 cycles**

absolute mode

Example: lsr $1234

N V B D I **Z** **C**

lsr

logical shift right

3 bytes **7 cycles**

absolute, X mode

Example: lsr $1234,X

N V B D I **Z** **C**

nop

no operation

1 byte **2 cycles**

implied mode

Example: nop

N V B D I Z C

ora

OR with accumulator

2 bytes **2 cycles**

immediate mode

Example: ora #42

N V B D I **Z** C

ora

OR with accumulator

2 bytes **3 cycles**

zero page mode

Example: ora $12

N V B D I **Z** C

ora

OR with accumulator

`2 bytes`   `4 cycles`

`zero page, X mode`

Example: ora $12,X

N V B D I **Z** C

ora

OR with accumulator

`3 bytes`   `4 cycles`

`absolute mode`

Example: ora $1234

N V B D I **Z** C

ora

OR with accumulator

`3 bytes`   `4/5 cycles`

`absolute, X mode`

Example: ora $1234,X

N V B D I **Z** C

ora

OR with accumulator

`3 bytes`   `4/5 cycles`

`absolute, Y mode`

Example: ora $1234,Y

N V B D I **Z** C

ora

OR with accumulator

`2 bytes`   `6 cycles`

`pre-indexed indirect mode`

Example: ora ($12,X)

N V B D I **Z** C

ora

OR with accumulator

`2 bytes`   `5/6 cycles`

`post-indexed indirect mode`

Example: ora ($12),Y

N V B D I **Z** C

pha

push accumulator

`1 byte`   `3 cycles`

`implied mode`

Example: pha

N V B D I Z C

php

push processor status

`1 byte`   `3 cycles`

`implied mode`

Example: php

N V B D I Z C

pla

pop accumulator

`1 byte`   `4 cycles`

`implied mode`

Example: pla

N V B D I **Z** C

plp

pop processor status

1 byte **4 cycles**

implied mode

Example: plp

N **V** **B** **D** **I** **Z** **C**

rol

rotate left

1 byte **2 cycles**

accumulator mode

Example: rol

N V B D I **Z** **C**

rol

rotate left

2 bytes **5 cycles**

zero page mode

Example: rol $12

N V B D I **Z** **C**

rol

rotate left

2 bytes **6 cycles**

zero page, X mode

Example: rol $12,X

N V B D I **Z** **C**

rol

rotate left

3 bytes **6 cycles**

absolute mode

Example: rol $1234

N V B D I **Z** **C**

rol

rotate left

3 bytes **7 cycles**

absolute, X mode

Example: rol $1234,X

N V B D I **Z** **C**

ror

rotate right

1 byte **2 cycles**

accumulator mode

Example: ror

N V B D I **Z** **C**

ror

rotate right

2 bytes **5 cycles**

zero page mode

Example: ror $12

N V B D I **Z** **C**

ror

rotate right

2 bytes **6 cycles**

zero page, X mode

Example: ror $12,X

N V B D I **Z** **C**

ror

rotate right

3 bytes   **6 cycles**

absolute mode

Example: ror $1234

N V B D I **Z** **C**

ror

rotate right

3 bytes   **7 cycles**

absolute, X mode

Example: ror $1234,X

N V B D I **Z** **C**

rti

return from interrupt

1 byte   **6 cycles**

implied mode

Example: rti

N **V** **B** **D** **I** **Z** **C**

rts

return from subroutine

1 byte   **6 cycles**

implied mode

Example: rts

N V B D I Z C

sbc

subtract with borrow

2 bytes   **2 cycles**

immediate mode

Example: sbc #42

N **V** B D I **Z** **C**

sbc

subtract with borrow

2 bytes   **3 cycles**

zero page mode

Example: sbc $12

N **V** B D I **Z** **C**

sbc

subtract with borrow

2 bytes   **4 cycles**

zero page, X mode

Example: sbc $12,X

N **V** B D I **Z** **C**

sbc

subtract with borrow

3 bytes   **4 cycles**

absolute mode

Example: sbc $1234

N **V** B D I **Z** **C**

sbc

subtract with borrow

3 bytes   **4/5 cycles**

absolute, X mode

Example: sbc $1234,X

N **V** B D I **Z** **C**

sbc

subtract with borrow

3 bytes **4/5 cycles**

absolute, Y mode

Example: sbc $1234,Y

N **V** B D I **Z** **C**

sbc

subtract with borrow

2 bytes **6 cycles**

pre-indexed indirect mode

Example: sbc ($12,X)

N **V** B D I **Z** **C**

sbc

subtract with borrow

2 bytes **5/6 cycles**

post-indexed indirect mode

Example: sbc ($12),Y

N **V** B D I **Z** **C**

sec

set carry

1 byte **2 cycles**

implied mode

Example: sec

N V B D I Z **C**

sed

set decimal mode

1 byte **2 cycles**

implied mode

Example: sed

N V B **D** I Z C

sei

disable interrupts

1 byte **2 cycles**

implied mode

Example: sei

N V B D **I** Z C

sta

store accumulator

2 bytes **3 cycles**

zero page mode

Example: sta $12

N V B D I Z C

sta

store accumulator

2 bytes **4 cycles**

zero page, X mode

Example: sta $12,X

N V B D I Z C

sta

store accumulator

3 bytes **4 cycles**

absolute mode

Example: sta $1234

N V B D I Z C

sta

store accumulator

3 bytes   **5 cycles**

absolute, X mode

Example: sta $1234,X

N V B D I Z C

sta

store accumulator

3 bytes   **5 cycles**

absolute, Y mode

Example: sta $1234,Y

N V B D I Z C

sta

store accumulator

2 bytes   **6 cycles**

pre-indexed indirect mode

Example: sta ($12,X)

N V B D I Z C

sta

store accumulator

2 bytes   **6 cycles**

post-indexed indirect mode

Example: sta ($12),Y

N V B D I Z C

stx

store X register

2 bytes   **3 cycles**

zero page mode

Example: stx $12

N V B D I Z C

stx

store X register

2 bytes   **4 cycles**

zero page, Y mode

Example: stx $12,X

N V B D I Z C

stx

store X register

3 bytes   **4 cycles**

absolute mode

Example: stx $1234

N V B D I Z C

sty

store Y register

2 bytes   **3 cycles**

zero page mode

Example: sty $12

N V B D I Z C

sty

store Y register

2 bytes   **4 cycles**

zero page, X mode

Example: sty $12,X

N V B D I Z C

sty

store Y register

3 bytes   **4 cycles**

absolute mode

Example: sty $1234

N V B D I Z C

tax

transfer accumulator to X

1 byte   **2 cycles**

implied mode

Example: txa

N V B D I **Z** C

tay

transfer accumulator to Y

1 byte   **2 cycles**

implied mode

Example: tya

N V B D I **Z** C

tya

transfer Y to accumulator

1 byte   **2 cycles**

implied mode

Example: tya

N V B D I **Z** C

tsx

transfer stack pointer to X

1 byte   **2 cycles**

implied mode

Example: tsx

N V B D I **Z** C

txa

transfer X to accumulator

1 byte   **2 cycles**

implied mode

Example: txa

N V B D I **Z** C

txs

transfer X to stack pointer

1 byte   **2 cycles**

implied mode

Example: txs

N V B D I Z C

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

pop

Discard the topmost card from the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

new

Draw a new card and place it on top of the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

new

Draw a new card and place it on top of the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

new

Draw a new card and place it on top of the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

new

Draw a new card and place it on top of the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

new

Draw a new card and place it on top of the played pile

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

draw 2

The player you choose must draw two additional cards

DRAW A NEW CARD; CONTINUE YOUR TURN

6502

the card game

a game for >= 2 people
version 1.3

Copyright (c) 2018 John Aycock
aycock@ucalgary.ca
@herrprofdr

This work is licensed under CC BY-SA 4.0
https://creativecommons.org/licenses/by-sa/4.0

OBJECT
The player who plays all their cards first wins.

SETUP
Deal eight cards face-down to each player. The remainder of the cards, face-down, form the draw pile. Take the topmost card from the draw pile and turn it over to form the played pile. Decide who goes first; play progresses clockwise.

TURNS
A player picks up zero or more cards as needed until they can match the card atop the played pile. (If a pop/new/draw card is played, it is discarded and replaced with a new card from the draw pile, and the player resumes trying to form a match.)
   The same attribute cannot be matched twice in a row. For instance, if the last match was on the number of bytes, the next match can't also be made on the number of bytes.

FORMING MATCHES
To match a card with the card on the top of the played pile, the two must be *exactly* the same in one (or more) of the following ways: instruction name; number of bytes; number of cycles; addressing mode; condition codes in their entirety. Parts that might match are in black boxes.
   Matches must be announced. The instruction name, addressing mode must be read out, along with the criterion that's being matched. For example, 's t a, zero page, also 2 bytes'

FAQ
Q. Can multiple pop/new/draw cards be played during one turn?
A. Yes.

Q. Does a status with none of the NVBDIZC flags highlighted match another one with none of the flags highlighted?
A. Yes.

Q. Does the mode 'absolute, X' match 'absolute, Y'?
A. No, the items in the black box must be exactly the same. For the same reason, '5/6 cycles' only matches another '5/6 cycles', and not '5 cycles' or '6 cycles'.

Q. Does the restriction on not matching the same attribute twice in a row still apply after a pop/new is played?
A. Yes.

Q. Can I keep a pop/new/draw card after using it?
A. No, you discard it. Nice try.

Q. How can the game be made longer?
A. Play multiple games; the first person to win eight games is the overall winner.

Q. How can you be so awesome?
A. It's a gift.