Neutral Density Filters

with Jim Wilson

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Neutral Density Filters

What are they?

Neutral Density Filters

What are they?

What can I do with them?

SPREAD
THE
LOVE

½ sec
f/22
ISO 200

4 sec
f/22
ISO 200

4 sec
f/22
ISO 200
with a
neutral
density
filter

1 second

10 seconds

What Are ND (Neutral Density) filters?

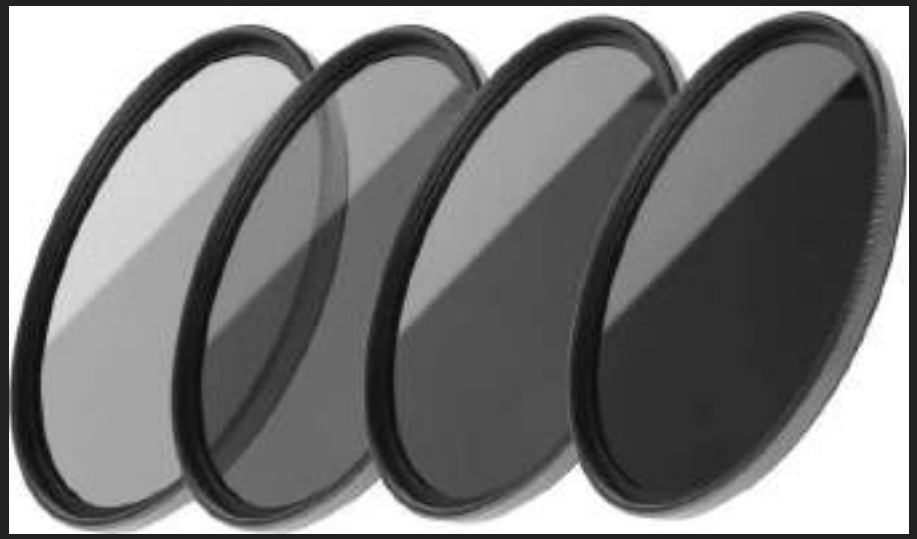
They are commonly called “sunglasses for your lens”.

There are two kinds. Solid and graduated or split.

- Solid has a fixed darkness throughout
- Graduated has just a portion darkened. Used to darken portions of an image such as skies

What Are ND filters?

There are two formats. Round ones that screw onto your lens and rectangular ones that go in a holder attached to the lens.



We will discuss the solid ones this evening.

There are two kinds of those.

Fixed and variable.

Fixed vs Variable

VARIABLE PROS

- Variables have two pieces of glass vs just one on a fixed. Rotate one to change the darkness.
- Variable ND’s are more convenient and faster to work with. You don’t have to change or add filters to get the shutter speed you want.
- Less stuff in your bag.
- Probably less expensive than a set of good fixed NDs

Fixed vs Variable

VARIABLE CONS

- When used at the darkest end of it’s limit, many will give an “x” pattern
- More prone to color casts than fixed
- Thicker due to two pieces of glass. Hence more susceptible to vignetting
- Some do not have good indications of how many stops you are set at.Some have labeled click stops. Some don’t. Makes accurate shutter speed calculations difficult.

Fixed vs Variable

FIXED PROS

- Tend to be less prone to color cast
- Only one piece of glass to shoot through.
- Often higher quality glass
- Fixed density allows for more accurate exposure calculations.
- Thinner than a variable. Hence, less chance of vignetting.

Fixed vs Variable

FIXED CONS

- Much slower to work with.
- More gear to keep track of.
- Good ones can be quite expensive.

CAUTIONARY TALE

Stacking filters

- You can stack filters in order to get the exposure you are looking for. If your 10 stop isn't enough, add on a 3 stop.
- Of course, when you start stacking, you are adding glass in front of the lens, and you are making the filters thicker. This makes for a better chance of a vignette on wide lenses.
- You can also stack a polarizer onto a filter. Loses a little better than 1 stop of light.

1/170 second, ISO 160, F/11. No filters

53 seconds, ISO 160, F/11. 6 stop ND filter

400 seconds, ISO 160, F/11. And now I have stacked a 10 ND and a 6 ND to make 16 stops of Neutral Density

Photographing moving water

1/100 second, ISO 160, F/13. No filters

7.5 seconds, ISO 160, F/13. With a 10 stop filter

SPREAD
THE
LOVE

SPREAD
THE
LOVE

1/9 second, ISO 160, F/22. No ND filter

12 second, ISO 160, F/16. With a 6 stop filter

1/3 second, ISO 160, F/22. No ND filter

21 seconds, ISO 160, F/18. 6 ND filter

1/160 sec @ f14

51 seconds @ f14 with 13 Stops ND filters

16 second exposure

with 12 stop ND filter

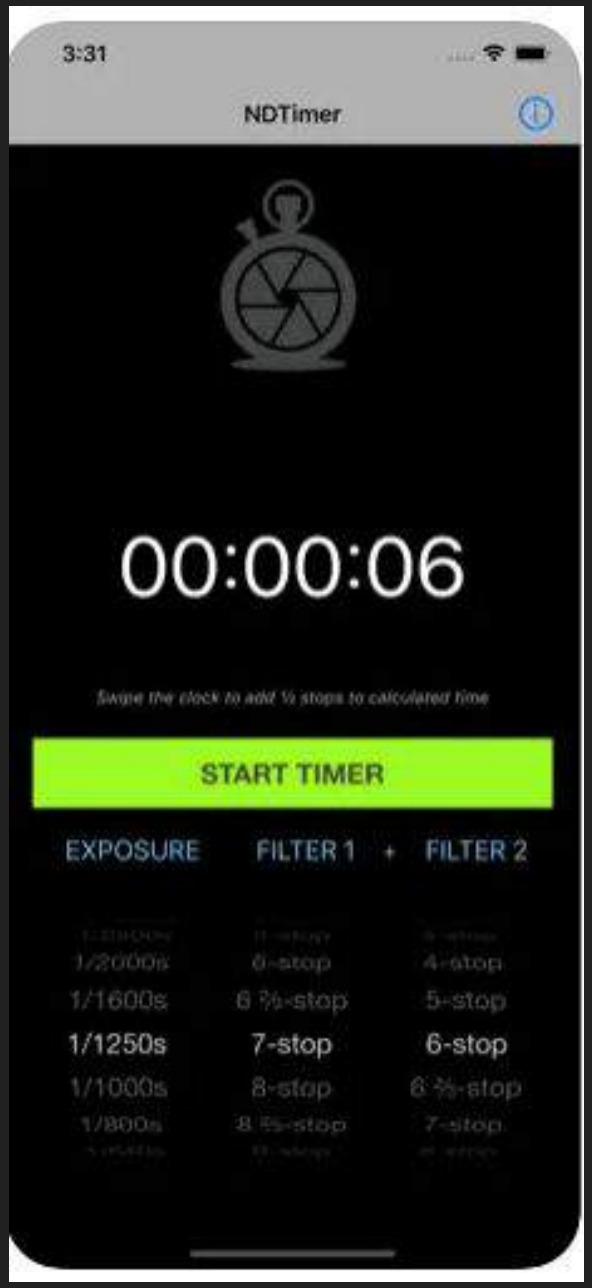
10

100100 sec @ f22

10f0

Densities of ND

- ND darkness is normally measured in f stops.
- A 2 stop ND will cut 2 stops of light from reaching the sensor.
- A 10 stop will cut 10 stops. If you are shooting at 1/100th sec and you add a 2 stop, your new shutter speed should be 1\25th sec (2 stops)
- Use a 10 stop and your new shutter speed should be 10 sec
- Each stop you add will double your exposure time. A difference from 5 min to 10 is still just one stop of light.



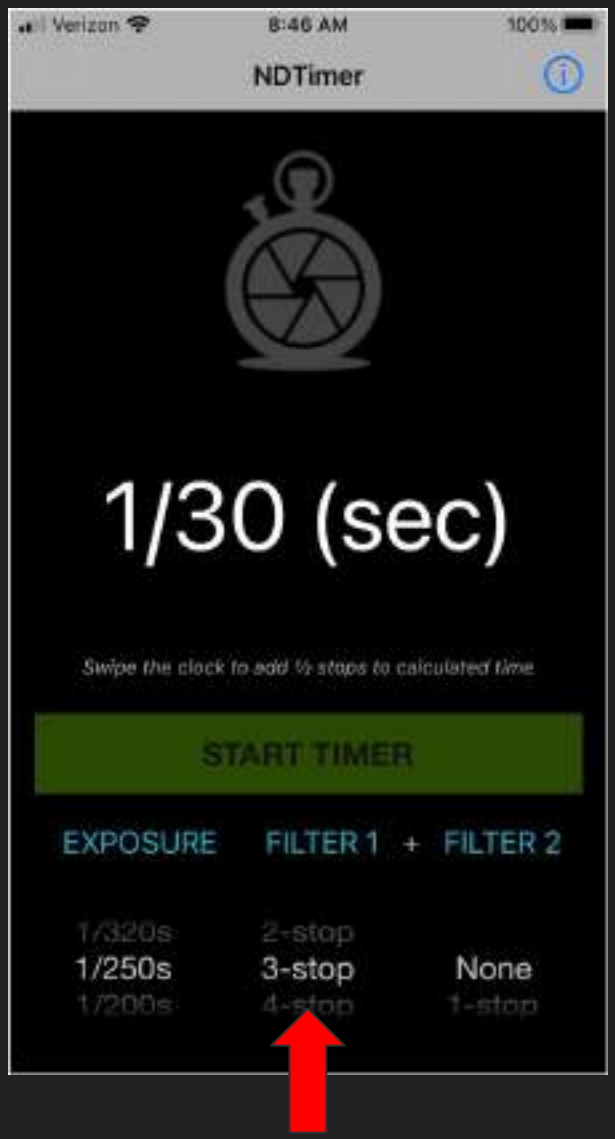
Do the math or use the app

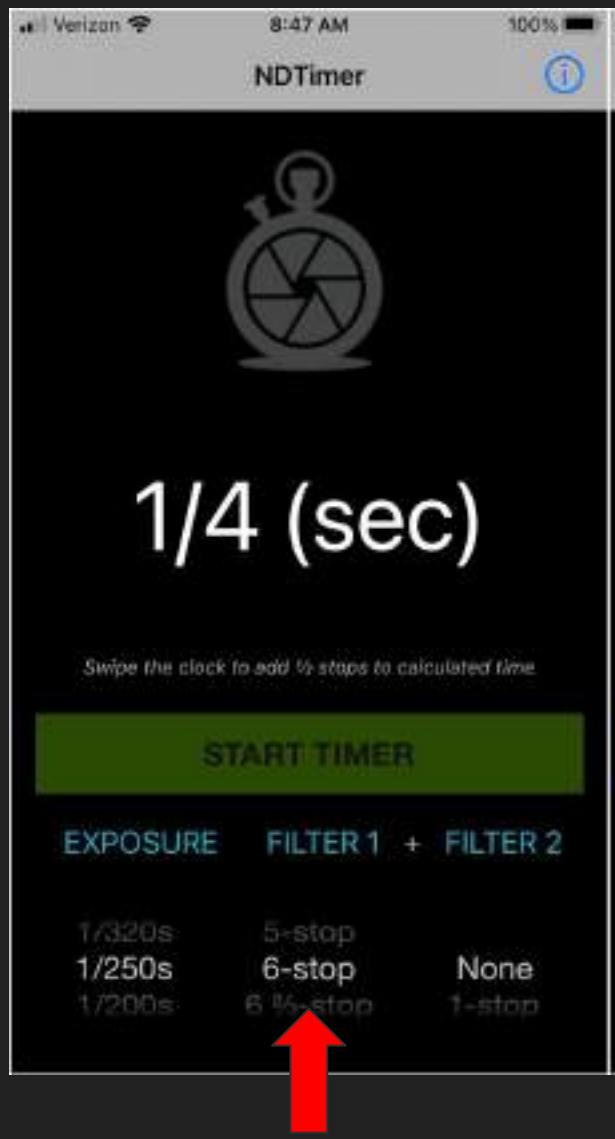
Many apps are available to allow you to easily calculate the appropriate shutter speed.

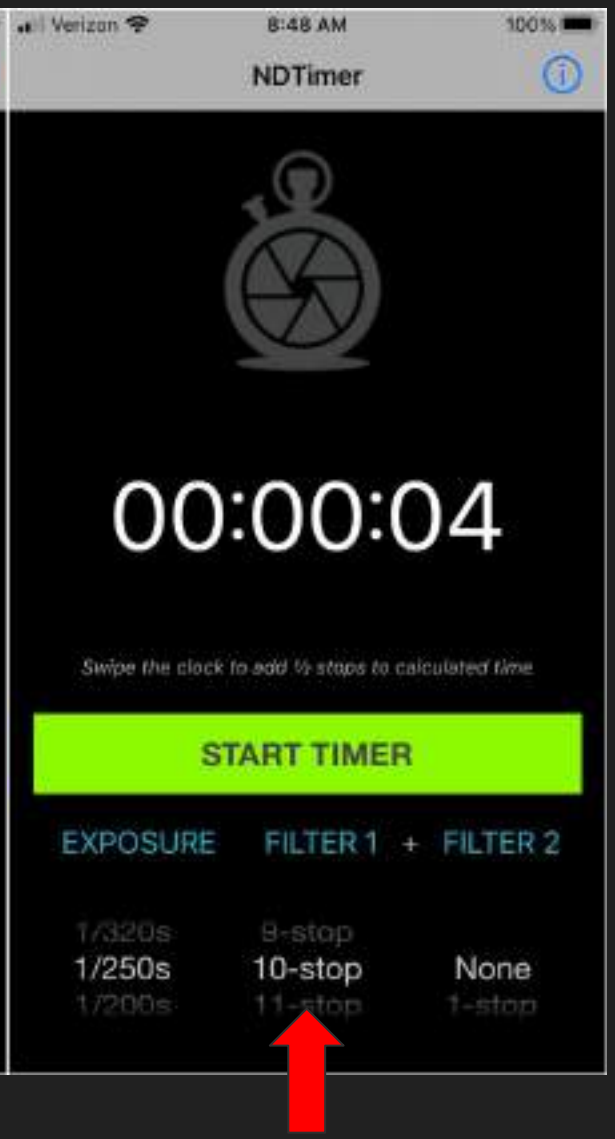
I use ND Timer

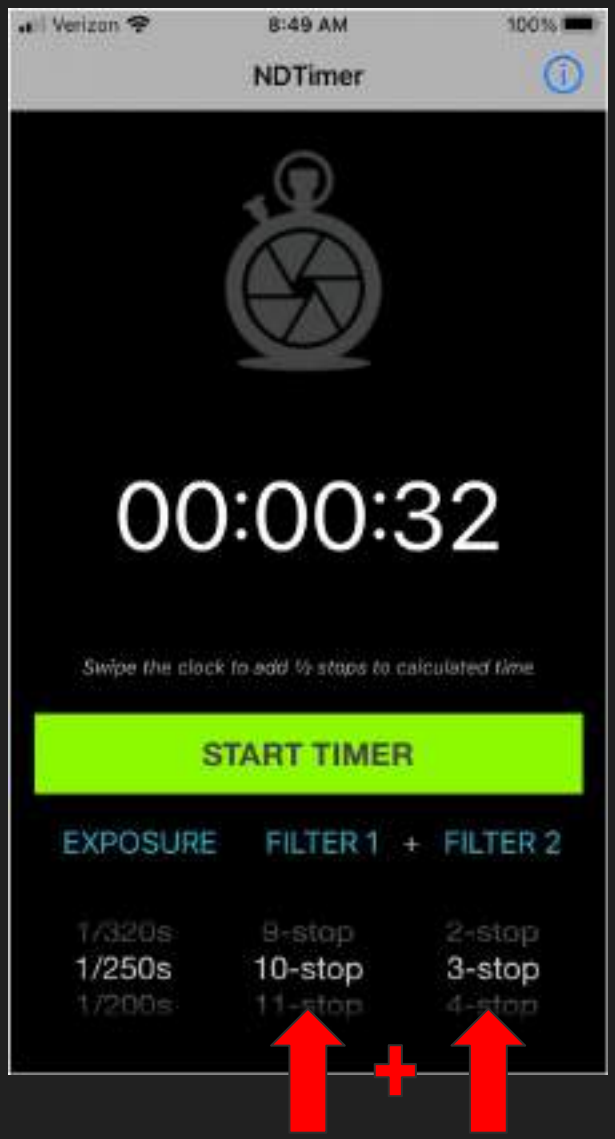
Some others

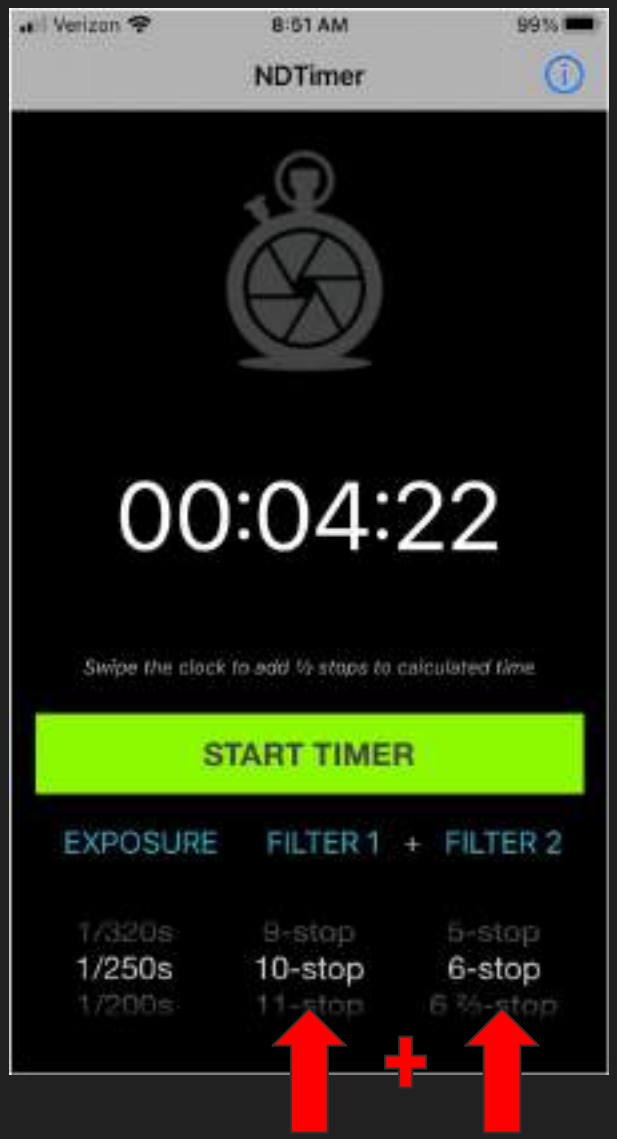
- Simple Exposure Calculator
- Camera Exposure Calculator
- Long Exposure Calculator
- ND Filter Expert
- Photopils

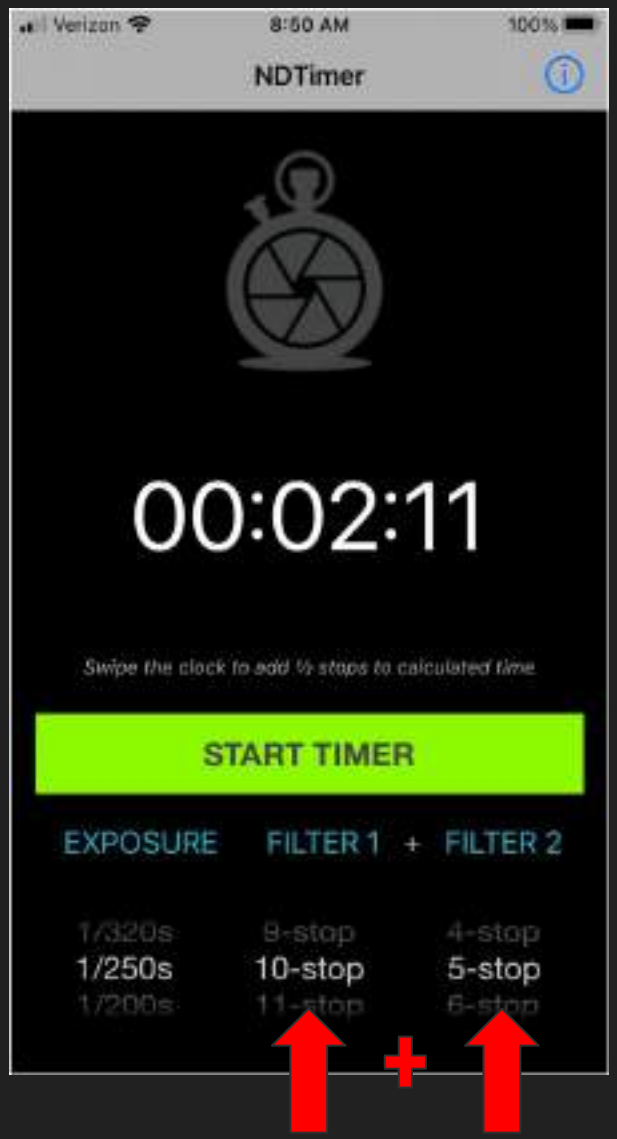

Verizon
8:46 AM
100%
NDTimer
1/30 (sec)
Swipe the clock to add ½ stops to calculated time
START TIMER
EXPOSURE
FILTER 1 + FILTER 2
1/320s
1/250s
1/200s
2-stop
3-stop
4-stop
None
1-stop


Verizon
8:47 AM
100%
NDTimer
1/4 (sec)
Swipe the clock to add ½ stops to calculated time
START TIMER
EXPOSURE
FILTER 1 + FILTER 2
1/320s
1/250s
1/200s
5-stop
6-stop
None
1-stop


Verizon
8:48 AM
100%
NDTimer
00:00:04
Swipe the clock to add ½ stops to calculated time
START TIMER
EXPOSURE
FILTER 1 + FILTER 2
1/320s
1/250s
1/200s
9-stop
10-stop
None
1-stop


Verizon
8:49 AM
100%
NDTimer
00:00:32
Swipe the clock to add ½ stops to calculated time
START TIMER
EXPOSURE
FILTER 1 + FILTER 2
1/320s
1/250s
1/200s
9-stop
10-stop
11-stop
2-stop
3-stop
4-stop


Verizon
8:51 AM
99%
NDTimer
00:04:22
Swipe the clock to add ½ stops to calculated time
START TIMER
EXPOSURE
FILTER 1 + FILTER 2
1/320s
1/250s
1/200s
9-stop
10-stop
11-stop
5-stop
6-stop
6 ¾-stop


Verizon
8:50 AM
100%
NDTimer
00:02:11
Swipe the clock to add ½ stops to calculated time
START TIMER
EXPOSURE
FILTER 1 + FILTER 2
1/320s
1/250s
1/200s
9-stop
10-stop
11-stop
4-stop
5-stop
6-stop

320 sec

80 sec @ f11

240 sec @ f11

1/40 sec @ f9

1/40 sec @ f9

150 sec @ f9 with 15 stop ND filter

PSFS

PSFS

PSFS

1/340 second, ISO 160, F/10. No ND filter

3 seconds, ISO 160, F/10. 10 stop ND filter

12 seconds, ISO 160, F/10. 12 STOP ND filter

8 minutes, ISO 160, F/14. 16 STOP ND filter

1/340 second, ISO 160, F/10. No ND filter

What gear do we need?

Camera

Tripod

Remote release

ND Filters

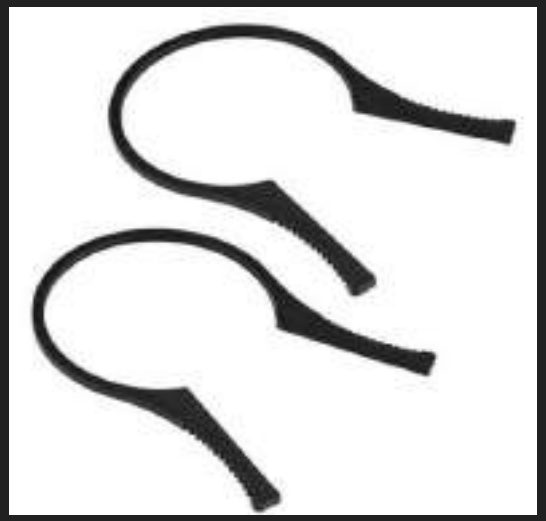
Step ups

Calc App

Step up rings and filter wrenches

If you plan to use your ND’s on different lenses, buy your filters or filter for your lens with the largest filter size. (Look under your lens cap) Then buy step up rings for the smaller lenses. Allows the use of filters on a number of different lenses. It also can help eliminate vignettes on the smaller size lenses

If stacking, get some filter wrenches. Invariably, your filters or step up rings will get stuck together sooner or later.



Camera settings

- Set to aperture priority
- Turn off long exposure noise reduction
- Set ISO to lowest number
- Close down aperture (Beware: very small apertures can reveal all your dust spots)
- Get your composition set
- Set your focus and change the mode to manual.
- Take a picture to get base exposure
- Use exposure compensation if you like
- Switch camera to manual mode

Start shooting

- Use your app to determine what ND filter(s) to use.
- Manually set app calculated shutter speed.
- If exposure is over 30 seconds, set to Bulb mode.
- Put filter(s) on the lens. Not too tight!
- If DSLR, cover the viewfinder to avoid light leaks. Not needed with mirrorless.
- Using your remote, take the picture.
- Make needed adjstments

Dealing with windy conditions

- Hang something from tripod
- Hide from the wind
- If possible, remove strap
- Take two shots(one at base exposure one with filters)and blend things as layers in Photoshop.

Other stuff

- Light can change during long exposures
- 3 minutes to 6 minutes is still just one stop of light
- Look inside your lens cap

Now comes the fun stuff!

So what else can we do?

Things you can do

Get rid of a cluttered background.

Before

Things you can do

Get rid of a cluttered background.

After

Turn out the lights with an ND filter, and get out your flashlight.

Start a collection of skies

Things you can do

Have no shame like me?

Replace the sky!

Before

Things you can do

Have no shame like me?

Replace the sky!

After

Things you can do

Have no shame like me?

Replace the sky!

After

DELLBROOK | JKS
DELLBROOK | JKS

Things you can do

Make your own light

Before

Things you can do

use

Use ND to extend exposure. Use flashlight to light paint the scene.

30 seconds.

After

1.9 second exposure

Three 30 second exposures. Light painted and blended in Photoshop

Things you can do

Before

Make unwanted things disappear.
1/210 sec @ f11

Things you can do

After

Make unwanted things disappear.
5 1/2 min @f11 15 Stop ND filter

Things you can do

Make people disappear!

Things you can do

After

Make unwanted things disappear.

So give it a try…. Get out there and experiment!

Thank you!

Jim Wilson

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