Hot Pavement Cool Solution

A Two Part Study of Paint Color on Surface Temperatures

HYPOTHESIS

I think white paint will be the coolest paint color on the driveway because white reflects more of the suns rays than dark colors.

ABSTRACT

This was a 28 day two-part experiment to determine what color of paint would lower the surface temperature of hot asphalt. I noticed that my feet burned when walking across the asphalt so I developed this study to find a way to lower the surface temperature.

In the first part of the study, I tested different paint colors on the asphalt to see which color stayed the coolest in the sun. I measured the surface temperature of each color for 14 days. The results showed that white paint lowered the temperature the most.

In the second part of the study, I painted a white sidewalk-shaped path across the asphalt. I measured the temperature of the painted path and compared it to the asphalt for 14 days. The results showed that the white painted path lowered the surface temperature and made it more comfortable to walk on barefoot.

BACKGROUND

During the summer months, black asphalt can become very hot. I noticed this when my feet got red marks and felt burned while walking barefoot from the swimming pool across the asphalt to the garage to use the bathroom. This made walking uncomfortable for both me and my guests.

I wanted to find a way to walk across the asphalt without wearing shoes and without getting burned. I wondered if painting a sidewalk across the asphalt would lower the surface temperature and make walking less painful on hot days. This question inspired me to create a science fair project to test whether paint color could help solve this problem.

MATERIALS

- Sherwin-Williams external paint
- #7005 White
- #6449 Topiary Tint
- #6443 Relish
- #9040 Reseda Green
- #6454 Shamrock
- #6764 Swimming
- #6493 Ebbtide
- #6509 Georgian Bay
- #7071 Gray Screen
- #7660 Earl Grey
- Paint brushes
- Asphalt sealant
- Etekcity infrared thermometer
- Clipboard and paper

QUESTION

Which paint color would cool black asphalt most effectively so that people can walk on it without burning their feet?

RESULTS

Study Phase 1

The white painted square had the largest cooling effect, reducing surface temperature by 13.8° F during the hottest part of the day. White was chosen for the sidewalk color for phase 2 of the study.

Study Phase 2

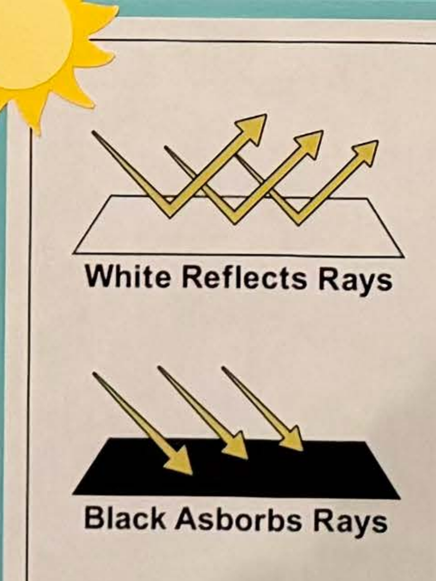
The white painted sidewalk lowered the surface temperature by 21.6° F.

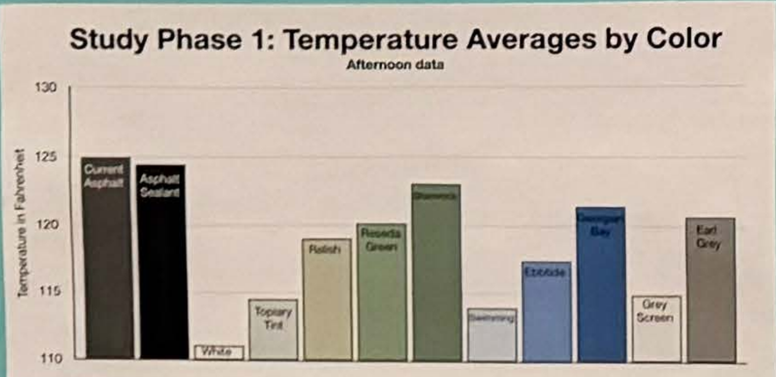
Study Phase 1: Temperature Averages by Color

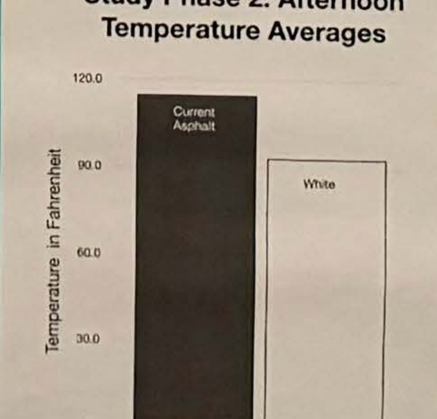
	Morning Door	Morning Drive	Afternoon Door	Afternoon Drive	Evening Door	Evening Drive	Overall Average	Afternoon Averages only
Current Asphalt	77.0	74.0	123.1	126.7	96.8	99.5	99.5	124.9
Asphalt Sealant	77.9	73.7	123.1	125.7	97.3	99.3	99.5	124.4
White	75.6	72.1	110.0	112.3	93.1	94.5	92.9	111.1
6449 Topiary Tint	76.2	72.2	112.9	116.0	94.2	96.4	94.7	114.5
6443 Relish	76.4	72.5	120.3	117.8	96.2	96.2	96.5	119.0
9040 Reseda Green	76.7	72.8	118.8	121.5	93.8	96.1	96.6	120.1
6454 Shamrock	77.9	73.4	122.7	123.4	95.4	97.4	98.4	123.0
6764 Swimming	76.8	72.1	113.8	113.9	94.3	94.6	94.3	113.9
6493 Ebbtide	76.7	72.7	115.8	119.0	93.1	96.3	95.6	117.4
6509 Georgian Bay	77.2	73.3	119.7	123.1	94.2	97.6	97.5	121.4
7071 Grey Screen	77.1	72.3	114.1	115.7	93.2	95.3	94.6	114.9
7660 Earl Grey	77.9	72.8	119.8	121.6	95.1	97.5	97.5	120.7

Study Phase 2: Temperature Averages White Painted Sidewalk vs Asphalt

	Air Temp	Current Asphalt	White
8/12/2025	84	110.1	94.6
8/13/2025	83	126.6	100.0
8/14/2025	84	143	100.9
8/15/2025	88	139.1	100.9
8/16/2025	88	112	88
8/16/2025	92	127.4	98.6
8/17/2025	87	141.2	105
8/18/2025	84	99.5	86.1
8/19/2025	87	120.7	94.6
8/20/2025	77	90.9	82.0
8/21/2025	79	94.1	81.6
8/22/2025	76	91.2	87.4
8/23/2025	79	102.4	90.7
8/24/2025	84	110.8	96.4
Average Temperature	83.7	114.9	93.3







PROCEDURE

Phase 1: Testing Paint Colors

- The asphalt was pressure washed to prepare it for paint and fresh sealant.
- Two 12 square grids were painted on a black asphalt driveway. Each square measured 6 x 6 inches and had unpainted asphalt in between as a control.
- The temperature of each square was measured three times a day for 14 days: Morning, Afternoon, Evening. This resulted in 1,008 temperature readings, which were averaged.

Phase 2: Testing the Best Color

- The paint color with the lowest temperature from Phase 1 was selected, which was white.
- A sidewalk-shaped path was painted across the asphalt using the white paint.
- The temperature of the painted path was measured once per day, during the hottest part of the day, for 14 days.

DISCUSSION

This was a two-part study. In the first phase, different paint colors were tested, and white paint was the most effective at lowering the surface temperature of asphalt. In the second phase, I painted a white sidewalk across the asphalt, which lowered the surface temperature by an average of 21.6°F making it more comfortable to walk on.

Temperature readings were affected by sunlight, clouds, and time of day. For this reason, measurements were taken three times a day at two locations over a 14-day period in the first phase. In the second phase, temperatures were measured once a day for 14 days.

After the study ended and temperatures dropped, another observation was made. Snow and ice melted quickly on the asphalt, but the white painted sidewalk stayed icy longer. This showed that while white paint helped cool hot asphalt in summer, it created a new safety concern in winter.

CONCLUSION

White paint is the best color to keep asphalt cool. Painting a white sidewalk path across black asphalt can help prevent burned feet and make it more comfortable to walk across.

REFERENCES

Vanderwest, S. (2025). Personal communication. Store Manager, Sherwin-Williams, Zionsville, Indiana.

Etekcity Infrared thermometer manual