# Flexibility improves over a 3 week period when stretching daily

5th Grade

## **Testable Question:**

Does flexibility improve over a 3 week period when stretching daily?

## **Prediction**:

I predict that flexibility will improve over a 3 week period when stretching daily.

#### Procedures

Participants included myself and both my parents.



### Background:

I chose this project because... My mother has been doing yoga since before I was born. In the recent years I have also been doing flexibility tests at school and I wondered if flexibility would improve over a short time when stretching on a regular basis. I decided to make it my science fair project (I also wanted to become more flexible).

#### In my research I found out that...

- Flexibility improves even in a short three week period, stretching only 14 minutes a day.
- It was hard to start a new habit.
- Flexibility will and does improve, but only when daily stretches are directed towards the particular muscle/joint you are testing.
- Flexibility is impacted by level and type of physical activity (it appeared to be affected by two 12 hour car rides and repetitive activity on the days our family was skiing).
- To better demonstrate improvement in all areas I needed to match the area in the body of the stretches with that of the tests.

This project is important because... Knowing that stretching on a daily basis for less than 15 minutes every day will improve your flexibility can help motivate people to adopt stretching as an activity that they will participate in (which will also improve their health).

#### **Constant Conditions:**

Independent Variable: Stretches included in stretching routine

Dependent Variable: Flexibility as measured by: Sit and Reach Test, Zipper Test, and Hip Angle

Constant Conditions: Stretching routine (stretches, repetitions, time held) Time of day stretch done- evening How tests were performed

#### **Procedures: Stretching Routine**





- 14 minute routine
- The same stretches were done each time.
- Each stretch was repeated 2 times (twice for each side for sided stretches).
- Each repetition was held for 30 seconds.
- Routine was done in the evenings 6 nights per week.

#### Data and Trials:



- Measurements were done using the same tests each time.
- Tests were performed in the same way each time.
- Each test was repeated 3 times and the best of 3 results was used.

#### Results: measurements over time

Participant	Date	Baseline vs intervention	Sit and reach (cm)	zipper test (cm) R	zipper test (cm) L	Hip opening angle
1	2/13/22	Baseline average	33.97	4.5	4.75	0
2	2/13/22	Baseline average	35.88	-5.5	-6.75	106
3	2/13/22	Baseline average	47.31	1.8	2.4	99
1	2/20/22	WK 1	36.83	4	4	0
2	2/20/22	WK 1	36.20	-14.5	-9.5	97
3	2/20/22	WK 1	52.71	1	-4.5	100
1	2/27/22	WK2	38.74	6	5	30
2	2/27/22	WK2	44.45	-14	-14	104
3	2/27/22	WK2	51.44	2	-4.5	112
1	3/6/22	WK3	39.37	6	5	52
2	3/6/22	WK3	43.82	-10	-11	119
3	3/6/22	WK3	54.61	2.5	0	121

increased decrease no change

#### Results: measurements over time







What is flexibility? Flexibility is defined as the maximum range of motion in any particular joint, in other words, it is how far your stretch reflex will let you stretch without contracting your muscle.

#### Why is flexibility important?

Flexibility is important because it keeps you from getting hurt when doing something that involves physical activity.

#### How does stretching improve our flexibility?

Stretching improves flexibility by training your stretch reflex to let you stretch further without feeling pain or getting an injury.

#### What impacts flexibility?

There are three main things that affect flexibility: 1. Age- as we get older the lubricant between muscle fibers decreases, making it harder for them to overlap, 2. Genderconnective tissue in females has different properties, making them more flexible. 3. Having had a prior injury–after having an injury, your muscle contains scar tissue which causes muscle fibers to overlap differently.

Figure: This drawing illustrates the stretch reflex, which is a reflex that keeps you from over stretching and hurting yourself.

## Conclusion and Reflection:

I found out that:

-Over a period of 3 weeks, when stretching daily, some flexibility measured improved. -However, the Zipper test showed very little improvement.

This is probably because the zipper test tests shoulder joint flexibility and the exercises did not stretch the shoulder joint in the same way.

-Flexibility progress may be affected by other factors.

Like: age, gender, prior injury, physical activity, and not moving for 12 hours.

I was surprised:

That not all the flexibility tests improved.

If I did this project again: I would choose tests that match the stretches. I would include more participants and the length of the study.