



## Selection

---

```
const rectSelectionWithData = g.selectAll("rect.bar")
  .data(data, function (d) {
    return d.title;
} );
```

## Enter

---

```
rectSelectionWithData.enter()
  .append("rect")
  .attr("class", "bar forlegend")
  .attr("width", BAR_WIDTH)
  .style("fill", function (d) {
    return color(d.title);
  })
  .attr("x", function (d) {
    return _x(d.i);
  })
  .attr("y", _y(0));
```

# Update

---

```
d3.selectAll("rect.bar")
    .transition()
    .duration(1000)
    .attr("x", function (d) {
        return _x(d.i);
    })
    .attr("_legend", legend)
    .attr("height", function (d) {
        return _height(d.wg);
    })
    .attr("y", function (d) {
        return _y(d.wg);
    });
}
```

# Exit

---

```
rectSelectionWithData.exit().remove();
```

DOM-Elemente

JavaScript-Objekte

```
{title: "Rogue One", wg:155081681}
```

```
{title: "Moana", wg:12762232}
```

```
{title: "LaLaLand", wg:4102091}
```

DOM-Elemente

JavaScript-Objekte

Enter

```
{title: "Rogue One", wg:155081681}
```

```
{title: "Moana", wg:12762232}
```

```
{title: "LaLaLand", wg:4102091}
```

DOM-Elemente

JavaScript-Objekte



DOM-Elemente

JavaScript-Objekte

<rect>

{title: "Rogue One", wg:155081681}

<rect>

{title: "Moana", wg:12762232} }

<rect>

{title: "LaLaLand", wg:4102091}

Enter

DOM-Elemente

JavaScript-Objekte

<rect>

{title: "Rogue One", wg:155081681}

<rect>

{title: "Moana", wg:12762232}

<rect>

{title: "LaLaLand", wg:4102091}

Enter

<rect>

{title: "Fences", wg:6688105}

<rect>

{name: "Why Him?", wg:11002968}

## DOM-Elemente

## JavaScript-Objekte

Update

<rect>

{title: "Rogue One", wg:155081681}

<rect>

{title: "Moana", wg:12762232}

<rect>

{title: "LaLaLand", wg:4102091}

<rect>

{title: "Fences", wg:6688105}

<rect>

{title: "Why Him?", wg:11002968}

DOM-Elemente

JavaScript-Objekte

<rect>

{title: "Rogue One", wg:155081681}

<rect>

{title: "Moana", wg:12762232}

<rect>

{title: "LaLaLand", wg:4102091}

Exit

<rect>

<rect>

DOM-Elemente

**<svg:circle>**

**<svg:circle>**

**<svg:circle>**

JavaScript-Objekte

{ name: "FOMA", x: 12.2, y: 889.1 }

{ name: "AUSW", x: 112.2, y: 9.3 }

{ name: "BUHA", x: 43, y: 91.7 }

Exit



## Create a world

---

```
<h1></h1>
<script>

    /* global Matter */

    const engine = Matter.Engine.create();
    Matter.Engine.run(engine);

    const body = Matter.Bodies.circle(100, 100, 10, {
        isStatic: false
    });

    Matter.World.add(engine.world, [body]);

    Matter.Events.on(engine, "afterUpdate", function () {
        document.querySelector("h1").innerHTML = body.position.y;
    });

</script>
```

## D3 renderer

---

```
const dynamic = Matter.Composite.allBodies(engine.world);

const data = d3.selectAll("path.dynamic")
  .data(dynamic, function(d) {
    return d.id;
  });

data.enter().append("path");

d3.selectAll("path.dynamic")
  .attr("d", function(d) {
    return "M " + d.vertices.map(function(v) {
      return v.x + " " + v.y;
    }).join(" L") + " Z";
  });

data.exit().remove();
```

## A better exit

---

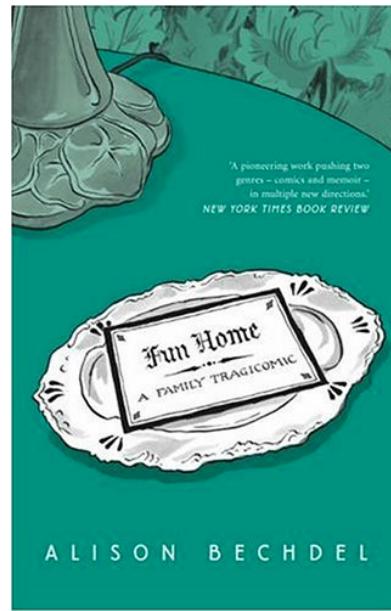
```
rectSelectionWithData.exit()
  .each(function (d) {
    const bodyX = _x(d.i) + BAR_WIDTH / 2;
    const bodyY = d.y + d.height / 2;

    const rectBody = Matter.Bodies.rectangle(bodyX, bodyY,
      BAR_WIDTH, d.height, {
        isStatic: false, data: d,
        color: color(d.title),
        className: "matter",
        legend: legend(d),
        title: d.title
      );
    }

    Matter.World.add(engine.world, [rectBody]);
  })
  .remove();
```

# Alison Bechdel

---



Fair use, <https://en.wikipedia.org/w/index.php?curid=7110859>

## Constraints

---

```
const circle = Matter.Bodies.circle(x, y, 8, {
    isStatic: false, color: "blue"
});
const constraint = Matter.Constraint.create({
    bodyA: circle,
    pointB: {x: width/2, y:height/2},
    length: 100,
    stiffness: Number(stiffness),
    render: {lineWidth: 1}
});
Matter.World.add(engine.world, [circle, constraint]);
```

## Without renderer – just tick

---

```
function tick() {
  g.selectAll("g.node")
    .attr("transform", function(d) {
      return "translate(" + d.body.position.x +
        "," + d.body.position.y + ")";
    });
}
```